

INTERSTATE 680 CALIFORNIA

HOTLANES

new solutions

for traffic relief

Southbound I-680 Express Lane Electronic Toll System Request for Proposals

Released by:



Alameda County
Congestion Management
Agency

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1. ACRONYMS AND GLOSSARY OF TERMS

ACCMA	Alameda County Congestion Management Agency
ACTIA	Alameda County Transportation Improvement Authority
AVI	Automatic Vehicle Identification
AVC	Automatic Vehicle Classification
BAFO	Best and Final Offer
BATA	Bay Area Toll Authority
Bidder	Any firm or company which submits a written and cost proposal in response to this RFP.
Caltrans	California Department of Transportation
CCTV	Closed Circuit Television
CCR	Camera Control Receiver
CHP	California Highway Patrol
CMP	Configuration Management Plan
Contract	The contract to be signed by the successful Bidder under this RFP
CSC	Customer Service Center - office and operation to be provided where I-680 Express Lane FasTrak [®] accounts will be managed and maintained.
CSR	Customer Service Representative
CTOC	California Toll Operators Committee
Customer	Person, company, or entity that applies and subscribes to the Bay Area Toll Authority for a FasTrak [®] Transponder for use in the HOT Lane.
DDD	Detailed Design Documentation
DMS	Dynamic Message Sign
DRDS	Dynamic Rate Display Sign
DSRC	Dedicated Short Range Communications
ED	Executive Director
ETC	Electronic Toll Collection
ETS	Electronic Toll System - The electronic collection of tolls utilizing an antenna and reader in the I-680 Express Lane and a transponder located on or in the vehicle. The antenna reads the transponder and the reader determines the ETC account number for toll payment purposes.
Evaluation Committee	The people that will be selected by the JPA to review and evaluate each proposal and provide selection recommendations to the group.

Southbound I-680 Express Lane ETS RFP
Version #1

FasTrak [®]	FasTrak [®] is the Electronic Tolling System that is utilized in California
FAT	Factory Acceptance Test
FIFO	First In First Out
FMAS	Facility Management and Accounting System
GUI	Graphic User Interface
HOT Lane	High Occupancy Toll Lane is a freeway or expressway lane which is open to HOVs without a toll charge and also open to SOVs that pay a specified toll (also referred to in this RFP and other attached documents as the I-680 Express Lane or the Express Lane).
HOV	High Occupancy Vehicle
HOV Lane	High Occupancy Vehicle Lane
ITS	Intelligent Transportation System
JPA	Sunol Smart Carpool Lane Joint Powers Authority
LED	Light Emitting Diode
LOS	Level of Service
MER	Mobile Enforcement Reader
MF	Mixed Flow
MOMS	Maintenance Online Management System
MTBF	Mean Time Between Failure - the mean calculated time, based on life cycle experience, between failures of an item or component.
MTTR	Mean Time To Repair - the mean time required to repair or replace an item; normally based on testing or actual field experience.
Non-Revenue Vehicle	Non-HOV authorized vehicles that are allowed to travel on JPA facilities free of charge.
NTCIP	National Transportation Communications for ITS Protocol
NTP	Notice to Proceed
PDA	Personal Digital Assistant
PDD	Preliminary Design Documentation
RCSC	Regional Customer Service Center
RTMS	Remote Traffic Microwave Sensor
RFID	Radio Frequency Identification
RF	Radio Frequency
RFP	Request for Proposal

Southbound I-680 Express Lane ETS RFP
Version #1

Express Lane	Another name for a HOT Lane
Express Carpool Lane	Another name for a HOT Lane
SOV	Single Occupancy Vehicle
Systems Integrator (SI)	The company who contracts with the JPA to provide the fully integrated ETS and all required services consistent with this RFP.
Systems Manager	The Systems Manager is the consultant that will, working closely with JPA staff, oversee the ETS design, development, integration, test, installation, operation and maintenance.
Tag	In-vehicle FasTrak [®] Transponder
TCP/IP	Transmission Control Protocol/Internet Protocol
Title 21	The Caltrans standard for Automatic Vehicle Identification Equipment, set forth in Title 21 of the California Code of Regulations, which must be followed by every electronic tolling system deployed in California
TDC	Toll Data Center - subsystem that will collect all roadside subsystem generated data and support the dynamic pricing process.
TZC	Tolling Zone Controller
Transponder	A small in-vehicle electronic device, used for the payment of tolls, which contains a unique identification number.
TMC	Traffic Management Center
UPS	Uninterruptible Power Supply
VDS	Vehicle Detection System
Violation	When an SOV not equipped with a FasTrak [®] transponder in good standing passes through a tolling zone or is in violation of the California Vehicle Code.
VTA	Santa Clara Valley Transportation Authority
WAN	Wide Area Network

2. INTRODUCTION AND PROCUREMENT OBJECTIVE

2.1 INTRODUCTION

The Sunol Smart Carpool Lane Joint Powers Authority (JPA) was created by AB 2032 to implement and operate a High Occupancy Toll Lane (HOT lane) over the Sunol Grade on Interstate 680. The Alameda County Congestion Management Agency (ACCMA) is responsible for planning, programming, and coordinating Federal, State, and Regional funds for transportation projects within Alameda County. The ACCMA along with the Alameda County Transportation Improvement Authority (ACTIA) and the Santa Clara Valley Transportation Authority (VTA) are the member agencies of the JPA. In addition to the programming duties, the ACCMA acts as project sponsor for certain projects or phases of projects in Alameda County. The ACCMA is the managing agency for the JPA created for the I-680 Smart Carpool Lane Project.

2.2 GENERAL DESCRIPTION OF THE PROJECT

In order to provide better traffic flow on I-680 in Alameda County and northern Santa Clara County, a southbound high occupancy vehicle (HOV) lane will be converted to an HOT lane. The Project Limits are from just south of the State Route (SR) 84 Interchange near Pleasanton to just south of Calaveras Boulevard (SR 237) in Milpitas. The planned HOT lane is also known as the Southbound I-680 Smart Carpool Lane Project. The California Legislature and Governor under AB 2032 and the Federal Highway Administration (FHWA) authorized this conversion as a pilot project to improve travel efficiency in the corridor and provide more options to individual travelers.

The ACCMA has been authorized to convert the existing interim HOV lane in the southbound direction to a HOT lane on behalf of the JPA. The program name used throughout this RFP will be the I-680 Express Lane, which refers to the Southbound HOT lane conversion project. The California Department of Transportation (Caltrans) is responsible for the design and construction of the I-680 Express Lane that will be converted into the HOT lane.

2.3 PROJECT PHASES

The I-680 Express Lane Project is divided into the following four (4) overall phases:

- **Phase I – Design, Manufacturing, and Factory Test** – This phase includes the ETS design, development, equipment procurement/fabrication, component testing, integration testing and the conduct of a detailed Factory Acceptance Test (FAT) of the entire system;
- **Phase II - Installation, Testing, and Approval** – This phase includes ETS equipment and software installation, conduct of a comprehensive on-site field acceptance test and engineering approval for ETS commissioning;

- **Phase III – System Performance Evaluation** – This phase includes a performance evaluation period of three (3) months under actual I-680 Express Lane operation, full ETS support, maintenance and operations by the SI; and
- **Phase IV - Warranty Period** – This phase includes full ETS maintenance, operations and system support during a Warranty Period that shall extend nine (9) months after Phase III approval, which would be granted upon successful system performance testing.

2.4 ISSUING OFFICE

This Request for Proposals (RFP) is being issued on behalf of the JPA by the ACCMA:

Alameda County Congestion Management Agency (ACCMA)
1333 Broadway, Suite 220
Oakland, CA 94612

2.5 CONTRACT OFFICER

The sole point of contact for all purposes of this procurement shall be the ACCMA's Contracts Administrator, Ms. Liz Brazil. Ms. Brazil's address and contact information is presented below:

Liz Brazil, Contracts Administrator
Alameda County Congestion Management Agency
1333 Broadway, Suite 220
Oakland, CA 94612
Telephone: 510-836-2560 (ext.33)
E-Mail Address: lbrazil@accma.ca.gov

2.6 PRE-PROPOSAL CONFERENCE

A pre-proposal conference will be held on **[Date]**, beginning at **[Time, Place, Address]**. The pre-proposal conference will allow prospective Systems Integrators to learn more about the project and to ask questions pertaining to the I-680 HOT Lane Project, the RFP, procurement process, etc.

Attendance at the pre-proposal conference is mandatory.

2.7 QUESTIONS AND INQUIRES

During the pre-proposal conference verbal questions will be accepted from prospective Bidders attending the conference. All verbal questions during the pre-proposal conference will be documented along with any responses given and issued as an addendum to the RFP. Any verbal questions that cannot be answered fully during the pre-proposal conference will also be addressed as part of the addendum process. Any potential Bidder finding a discrepancy in or

omission from the RFP, or in doubt as to the meaning, shall raise the issue(s) at the pre-proposal conference.

Other questions, inquiries, discrepancies or omissions, including those arising subsequent to the pre-proposal conference, must be submitted in writing and received by the ACCMA Contracts Administrator on or before **[Date]**. Questions may also be transmitted via e-mail to the Contracts Administrator. It is up to the Bidder to confirm that the e-mail was received by the Contracts Administrator. The JPA is not obligated to change the RFP in any way, but questions affecting the content of the RFP in a material way, or clarifying the intent, will be answered by means of an addendum to the RFP, which will be sent to all those persons who are known to have received the RFP and whose company was represented at the pre-proposal meeting. Answers to all written questions submitted in a timely manner will be distributed to all Bidders at the pre-proposal meeting and/or posted on the ACCMA's website within 10 days after the submission deadline. The JPA will not be responsible for communications concerning this RFP which are not in writing or are not made at the pre-proposal meeting.

2.8 SUBMISSION DEADLINE

To be considered, proposals must be delivered by **[Time]** local time on **[Date]** to the attention of the ACCMA Contracts Administrator at the above referenced address. Bidders who submit their proposals by mail should allow sufficient mailing and internal delivery time to ensure timely receipt by the Contracts Administrator. Proposals or unsolicited amendments to proposals arriving after the closing date and time will be rejected and returned unopened in accordance with applicable regulations.

Bidders shall complete and submit their proposals on the forms furnished with the RFP. All proposal forms are to be signed by an individual authorized to bind the Bidder, notarized if so indicated, and placed in the appropriate envelope or package.

Technical Proposals and Cost Proposals must be submitted in separate sealed envelopes or packages addressed to the Contracts Administrator and clearly marked as to their contents, (e.g., "Technical Proposal, Contract #", or "Cost Proposal, Contract #"). Failure to submit the proposals in the manner requested may result in the proposal being rejected as unacceptable.

Proposals shall not be opened publicly, and the identity of a Bidder shall not be disclosed prior to contract award.

2.9 DURATION OF OFFER

Proposals and, if required, Best and Final Offers (BAFOs) submitted in response to this solicitation are irrevocable for a period of 90 days following the closing date for the receipt of proposals and/or the BAFO(s). This period may be extended if requested by the Contracts Administrator and agreed to by a Bidder, in writing.

2.10 BOND REQUIREMENTS

All proposals must be accompanied by acceptable proposal security in the amount of 5% of the base proposal, which shall be enclosed with the sealed envelope or package containing the Technical Proposal. If a Bidder fails to accompany its proposal with the required proposal security in accordance with these instructions, the proposal shall be rejected as unacceptable.

The successful Bidder (Systems Integrator) shall be required to furnish, at the time of award of the Contract, a Performance Bond in the full amount of the Contract.

The Systems Integrator (SI) shall also be required to furnish, at the time of award of the Contract, a Payment Bond in the full amount of the Contract.

Acceptable security for proposal, performance and payment bonds shall be limited to:

- A Bond in a form satisfactory to JPA, underwritten by a Surety Company authorized to do business in the State of California. Attached to this RFP is the JPA Bond form that should be utilized by the Bidders (the Bond Form will be provided with the Final version of the RFP);
- A bank certified check, bank cashier's check, bank treasurer's check, or trust account; or
- A pledge of securities backed by the full faith and credit of the United States Government or bonds issued by the State of California.

3. GENERAL INFORMATION AND CONTRACT PROVISIONS

3.1 PURPOSE

The purpose of this section is to provide information to Bidders interested in preparing and submitting proposals to provide the Express Lane System including design, development, integration, implementation, maintenance and operations in accordance with the requirements set forth in this document and its references.

3.2 REVISIONS TO RFP

If it becomes necessary or desirable to revise any part of this RFP, or to provide additional information to enable potential Bidders to interpret its provisions, the JPA will issue an addendum which will be provided to each person who is known to have received a copy of the RFP and whose company was represented at the pre-proposal meeting. Acknowledgement of the receipt of any and all addenda will be required of Bidders, and shall accompany the Bidder's Technical Proposal.

3.3 PROPOSAL ACCEPTANCE, REJECTION, DISCUSSION AND BASIS FOR AWARD

The JPA reserves the right to accept or reject, in whole or in part, any and all proposals received in response to this RFP; to waive or permit cure of minor irregularities, and to conduct discussions with all qualified Bidders who have submitted acceptable proposals, in any manner necessary to serve the best interests of the JPA. The JPA also reserves the right, at its sole discretion, to award (or not to award) a contract based upon the written proposals received, without discussions or negotiations.

Award of the contract will be subject to the approval of the Executive Director (ED) of the JPA.

3.4 ORAL PRESENTATIONS

Bidders may be required to make one or more oral presentations in order to clarify their proposals and to respond to the questions of the Evaluation Committee. Only Bidders that submit proposals that have been judged to be compliant with the RFP requirements and, therefore, eligible to be considered for selection, will be invited to make oral presentations. Oral presentations may be sound and/or video recorded for the exclusive use of the Evaluation Committee and associated JPA members. The oral presentations will be scheduled at the convenience of the JPA after the initial review and as part of the overall evaluation of the proposals.

3.5 BEST AND FINAL OFFER

The JPA reserves the right to request Best and Final Offers (BAFOs) from any or all of the Bidders. If the BAFO process is utilized, the JPA may enter into discussions with one or more Bidders and request a BAFO document from such Bidders, or the JPA may request BAFO(s) without first discussing any issues with the selected Bidder(s). All Bidders that might be selected to participate in discussions with the JPA shall be advised of any deficiencies in their proposals, and JPA may issue a change in the scope of the work or to other provisions of the Contract documents. The selected Bidder shall be offered a reasonable opportunity to correct or resolve any deficiencies and to submit such cost and/or other technical revisions to their proposals that may result from the discussions. At the conclusion of the discussions, a final common cut-off date which allows a reasonable opportunity for submission of written final revisions shall be established, and those Bidders that are selected to remain in contention for the Contract will be notified, in writing, to submit proposal revisions. The JPA will consider the revised cost and/or technical information and re-evaluate and possibly revise the proposal ratings as might be appropriate.

3.6 INCURRED PROPOSAL EXPENSES

The JPA will not be responsible for any costs incurred by a Bidder in preparing and submitting a response to this RFP, or for any other associated costs, including attendance at the pre-proposal meeting, representation at the oral presentation, attendance at BAFO meeting(s), etc.

3.7 PROPOSAL FORM

Proposals should be prepared simply and economically, providing a straightforward and clear description of the Bidder's proposal for meeting the requirements of this procurement. Proposals shall meet all of the requirements that are presented in Section 4 of this RFP. Oral, facsimile, telegraphic or mailgram proposals or amendments will not be accepted unless specifically requested in writing by the Contracts Administrator.

One original and 5 type-written, hard copies of the Bidder's proposal shall be received by the ACCMA Contracts Administrator at the time and on the date as previously stated in this RFP. An electronic copy of the technical and cost proposals shall also be submitted, to the attention of the Contracts Administrator. The proposal of each Bidder shall be signed by a corporate officer, partner, proprietor, or other person authorized to legally bind the Bidder.

3.8 CALIFORNIA PUBLIC RECORDS ACT NOTICE

Each Bidder should give specific attention to the identification of those portions of its proposal that it considers to be confidential, proprietary commercial information or trade secrets, and provide justification as to why such materials, upon request, should not be disclosed by the JPA under the California Public Records Act, California Government Code Sections 6250, *et seq.*

3.9 SOFTWARE AND HARDWARE DEFINITIONS

The definitions below are to be used with the license, confidential information and escrow provisions in Sections 3.10 through 3.13 of this RFP.

3.9.1 Confidential Information

Confidential information with respect to a person or entity means information, knowledge or data, whether in written, oral, visual, machine recognizable or electronic form, which provides independent economic value to such person or entity from (i) not being generally known in the relevant trade or industry or (ii) not being generally known to, or readily accessible by proper means by, competitors of such person or entity and other persons who can obtain economic value from them, including, without limitation, information about the dynamic pricing algorithms and information from third parties and all other information which a person or entity has a reasonable basis to know was created, modified or used and held secret by another party or that was accepted by such other person or entity from any third party under an obligation of confidentiality. Notwithstanding the foregoing, Confidential Information shall not include: (i) information which a party (the “Recipient”) can demonstrate by its files was already in the possession of such party prior to receipt of such information from the other party (the “Disclosing Party”) (provided that access to such information was gained by the Recipient from a third party which had the right to disclose such information without restriction), (ii) information which is in the public domain prior to the date of this Contract, (iii) information which, not as a result of the disclosure by the Recipient, becomes part of the public domain after disclosure, and (iv) information which is hereafter lawfully disclosed to Recipient by a third party (other than any employees or agents of either party) who is not under an obligation to maintain the confidentiality of the information.

3.9.2 Development Documents

Development documents mean those documents that are delivered to the JPA by the SI during the system design, development and implementation processes.

3.9.3 Intellectual Property Rights

Intellectual property rights means any and all legal rights regarding intangible property existing from time to time under domestic and international patent law, copyright law, moral rights law, trade secret law, trademark law, unfair competition law or other similar rights.

3.9.4 Express Lane Developments

Express Lane developments means: (i) those portions of the Software and the Special Hardware that were developed under this Contract to satisfy the specifications or requirements of the Express Lane project; (ii) those modifications of pre-existing

software and hardware that were made to satisfy the specifications or requirements of the Express lane project, and (iii) any changes to the foregoing that are made in response to requests by the JPA or to address the changing needs of the Express lane project.

3.9.5 Object Code

Object code means: (i) the machine readable code version of the Software, which is substantially or entirely in binary form and is intended to be executable by a computer after suitable processing or linking but without intervening steps of compilation or assembly; and (ii) the written instructions necessary or appropriate for the JPA to install and use the Object Code form of the Software for the Express Lane system.

3.9.6 Personal Information

Personal information means information that identifies individual Express Lane system users, such as the user's name, address, telephone number, email address, credit card number and expiration date and license plate number.

3.9.7 Release Event

Release event has the meaning specified in Section 3.13.3.

3.9.8 Software

Software means any Source Code, Object Code, computer databases and any associated html and graphics files (other than Third Party Software that is separately licensed by the JPA) that are supplied by to the JPA by the SI under this Contract, together with all enhancements, improvements and modification to the foregoing.

3.9.9 Software Documentation

Software documentation means the Source Code on industry standard media and source code listings in human readable form of all Software including logic equations for programmable array logic integrated circuits (as well as the compiler or assembler and associated software tools for the Source Code); all design documents, specifications, flow charts, data flow diagrams and other materials or documents which explain the performance, function or operation of individual software programs and the interaction of programs within the Express Lane system; all control files and scripts used to compile link, load and/or make the applications and systems, test scripts, test plans and test data; all password security codes and any other information and documents necessary to operate and maintain the Software.

3.9.10 Source Code

Source code means the computer programming code (other than binary code) and any procedural code such as job control language, which may be printed out or displayed in human readable form.

3.9.11 Special Hardware

Special hardware means any mechanical part and any piece of electrical or digital equipment that SI designs, develops or modifies for the Project, including, without limitation, lane controllers, hand-held reader devices, together with the written instructions necessary or appropriate to install and operate the Special Hardware.

3.9.12 Special Hardware Documentation

Special hardware documentation means the documents that contain the necessary to have the Special Hardware manufactured and supplied to the JPA, including, without limitation, the manufacturing drawings, data and specifications of the equipment and spare parts and of their tools, dies, and fixtures, including art work necessary to fabricate circuit boards; license(s) to all applicable Intellectual Property, if any; all drawings from top level equipment outline, interface and mounting, through assembly, sub-assembly, and fabricated piece parts drawings necessary to manufacture the equipment; all schematics and wiring diagrams and cable harness drawings; all installation, configuration, and layout drawings; all block diagrams and family trees; all assembly instructions and drawings; all test specifications for top-level equipment and for all assemblies to the lowest testable level of assembly; all test procedures for all tests; all maintenance manuals and procedures; all operator manuals; all flow charts relevant to the manufacture, assembly, programming, and operation of the equipment; part lists containing sufficient information to procure all parts and material required to manufacture the equipment from its primary source, except software products available commercially; documentation for the source code if not provided otherwise; all password security codes and any other information and documents necessary to manufacture and maintain the Special Hardware. Notwithstanding the foregoing, the Special Hardware Documentation does not have to include the information necessary to manufacture any Special Hardware part that is generally commercially available from at least two suppliers.

3.9.13 System Information

System information means the Software Documentation and the Special Hardware Documentation.

3.9.14 Third Party Software

Third party software means computer programs, computer databases and any associated html and graphics files that are not owned by the SI and are necessary for the proper functioning of the I-680 Express Lane system.

3.10 LICENSES

The provisions below substantially set forth the terms of the licenses that must be granted to the JPA:

3.10.1 Object Code License

The SI shall grant the JPA a fully-paid, perpetual, non-exclusive, irrevocable royalty-free right and license to use, copy, perform and sublicense the Software in Object Code form in connection with the installation, operation, maintenance and improvement of the Express Lane system.

3.10.2 Source Code and Software Documentation License

The SI shall grant the JPA a fully-paid, perpetual, non-exclusive, irrevocable royalty-free right and license to use, copy, perform, modify and sublicense, and create derivative works of, the Software in Source Code form (including, without limitation, the right and license to assemble or compile the foregoing into Object Code form) and the Software Documentation, as deemed necessary or appropriate by the JPA to operate, maintain and improve the Express Lane system. Included in this license are the rights to decompile, disassemble or reverse engineer the Software. The license rights granted in this Section 3.10.2 may not be exercised until a Release Event has occurred, at which time they may be exercised automatically without the requirement of further action by the JPA or the SI.

3.10.3 Special Hardware Documentation License

The SI shall grant the JPA a full-paid, perpetual, non-exclusive, irrevocable right and license to use, copy, perform, modify and sublicense, and create derivative works of the Special Hardware Documentation, as deemed necessary or appropriate by the JPA to operate, maintain, manufacture and procure the Special Hardware.

3.10.4 Express Lane Developments License

Notwithstanding the non-exclusivity provisions of Sections 3.10.1, 3.10.2 and 3.10.3, the SI shall grant the JPA a fully-paid, perpetual, exclusive, irrevocable royalty-free right and license to use, copy, perform, modify and sublicense, and create derivative works of, the Express Lane Developments in connection with the installation, operation, maintenance and improvement of the Express lane system.

3.10.5 License Limitations

In exercising its rights under Section 3.10.1 through Section 3.10.3, the JPA shall not license, sublicense, sell, resell, transfer, assign, distribute or modify the Software for use with any highway or transportation structure other than those under the jurisdiction of the JPA.

3.10.6 Other License Terms

1. All modifications, improvements and enhancements to the Software shall be licensed to the JPA without any additional charge to the JPA.
2. The JPA shall have the right, in its discretion, either to contract with the SI for maintenance services and customer services; to provide its own maintenance services and customer services; or, to contract with others for the maintenance services and/or customer services.
3. The SI shall deposit in escrow pursuant to the Escrow Agreement (See Section 3.13) all Source Code, Software Documentation and Special Hardware Documentation for the Software and the Special Hardware and for all modifications, improvements and enhancements to the Software and the Special Hardware.
4. After a Release Event, the JPA shall be entitled to make its own modifications, improvements and enhancements to the Software or to contract with others to make such modifications or improvements, which modifications, improvements and enhancements the JPA may use in connection with the system and the systems of its member organizations.
5. The SI shall indemnify the JPA against any infringement by the software of any patent, copyright, trademark or trade secret of any other party.
6. The SI shall provide maintenance services and other services for the period described in the Contract.
7. The SI shall supply to the JPA any new software products which may be useful in the operation of the Express Lane system on a most favored customer basis.
8. The SI shall represent and warrant that the Software, the Special Hardware and the System Documentation comply with all requirements of the Contract, do not infringe the Intellectual Property Rights of any third party, do not, in the case of the Software, contain any "virus," illicit code or defect. The SI shall also make other standard representations and warranties customary in a contract of this nature and scope.

3.11 THIRD PARTY LICENSES

The SI shall provide the JPA with fully-paid, non-exclusive, perpetual, irrevocable, royalty-free licenses to use the Third Party Software as necessary or appropriate for the JPA to operate, maintain and improve the Express Lane system. All such Third Party Software licenses shall provide for the grant of substantially the same rights to the JPA to use the Third Party Software as are granted to the JPA with respect to Software in Sections 3.10.1 and 3.10.2.

3.12 OWNERSHIP AND PROTECTION OF CONFIDENTIAL INFORMATION

The following provisions show how Confidential Property should be addressed.

3.12.1 Ownership

The JPA shall retain all right, title and interest, including, without limitation, all Intellectual Property Rights, in the Confidential Information furnished by it to the SI. The SI shall retain all right, title and interest, including, without limitation, all Intellectual Property Rights, in the Confidential Information furnished by it to the JPA.

3.12.2 Confidential Information in Proposal and Development Documents

The SI shall specify what information in its Proposal it considers its Confidential Information. The JPA expects that the designation of Confidential Information will be kept to a minimum and will be limited to pricing. The SI shall also specify what information in the Development Documents it considers its Confidential Information.

3.12.3 Protection

Except as necessary to carry out its obligations under this Contract, each party (a "Recipient") shall not, at any time during or after the term of this Contract disclose the Confidential Information of the other party (a "Disclosing Party") to any person whatsoever, examine or make copies of any reports or other documents, papers, memoranda or extracts embodying the Confidential Information for other use, or utilize for the Disclosing Party's own benefit or for the benefit of any other party any such Confidential Information. Each party shall at all times exercise the same degree of care which it regularly uses to protect its own proprietary information to maintain the confidential, secret or proprietary character of all Confidential Information, provided that each party shall use at least a reasonable degree of care. Notwithstanding the foregoing, either party may disclose Confidential Information of the other party: (i) to its employees and professional advisors to the extent necessary to allow the party to carry out its obligations under this Contract; provided that such persons are advised of the confidential nature of the information and are under an obligation to maintain its confidentiality; and (ii) as required under the Access to Public Records Act, State Government Article, Title 10, Subtitle 6, Annotated Code

of California. Upon the completion of its obligations to be performed hereunder, the SI shall promptly return to the JPA all JPA Confidential Information.

3.12.4 Exception from Non-Disclosure

The non-disclosure obligations shall not apply to disclosures made by a party in response to any deposition, interrogatory, request for documents, subpoena, civil investigative demand or similar legal process ("legally compelled disclosure") provided that the conditions of this Section 3.12.3 are complied with by the disclosing party. In the event that the disclosing party or any of its representatives are requested or become subject to make a legally compelled disclosure of any of the Confidential Information of the other party, the disclosing party shall first provide the other party with prompt prior written notice of such requirement so that the other party may seek a protective order or other appropriate remedy and/or waive compliance with the terms of the Contract.

3.12.5 Personal Information

Personal Information may be subject to special procedures established by the JPA to maintain its confidential nature. The SI shall agree to abide by any such special procedures and to allow the JPA to review its implementation of these special procedures.

3.12.6 Injunctive Relief

The parties shall acknowledge that the unauthorized disclosure or misuse by a party of the Confidential Information of the other party could irreparably damage the other party and/or third parties dealing with the other party, and that monetary damage would not be an adequate remedy for any such breach. In the event of a breach or threatened breach by a party of any of the provisions of the Contract, the non-breaching party shall be entitled to injunctive relief in any court of competent jurisdiction restraining the breaching party from breaching the terms hereof or from disclosing any Confidential Information of the non-breaching party to any person. Nothing contained herein shall be construed as prohibiting any party from pursuing any other remedies available to it, either at law or in equity, for such breach or threatened breach, including specific performance and recovery of monetary damages. In addition, the party breaching or threatening breach shall indemnify the other party for its attorneys' fees and court expenses incurred in enforcing the Contract.

3.13 ESCROW

The Proposal shall provide for the Software Documentation to be escrowed substantially as follows:

3.13.1 Escrow Agreement

Within ninety (90) days after the execution of the Contract, the SI shall enter into an escrow agreement (the “Escrow Agreement”) with the JPA on the terms and conditions provided in this Section 3.13 and such other terms and conditions as are customary and reasonably acceptable to SI and JPA. Pursuant to the terms of the Escrow Agreement, the SI shall deposit with an Escrow Agent located in California and satisfactory to the JPA, without charge to the JPA, the Software Documentation. If the SI revises or supplements any of the System Information deposited, or creates additional Software Information, the SI shall deposit a complete set of such revised, supplemented or additional Software Information with the Escrow Agent within thirty (30) days of such revision, supplementation or creation, and the SI shall indicate with each deposit which documents and which pages have been revised, supplemented or added to the last deposit. The Escrow Agreement shall continue until there is a Release Event or the Software is no longer in use by the JPA. The SI shall be responsible for the payment of all costs arising in connection with the maintenance of the escrow referred to in this section throughout the entire term of the Escrow Agreement.

3.13.2 Release Events

Release event means that one or more of the following have occurred:

- SI has filed a voluntary petition in bankruptcy or for a reorganization or to effect a plan or other arrangement with its creditors, files an answer to a creditor’s petition or other petition against it for an adjudication in bankruptcy or for a reorganization admitting the material allegations thereof, or applied for or permitted the appointment of a receiver, trustee or custodian for any substantial portion of its properties or assets, and such petition or proceeding is not dismissed within sixty (60) days of the filing or initiation thereof;
- SI has ceased its ongoing business operations;
- SI has substantially ceased the sale, licensing, maintenance or other support of the Software;
- SI breaches any material provision of this Contract and fails to cure the breach within fifteen (15) days of notice thereof by the JPA; provided that upon the third material breach of this Contract by SI, SI shall have no opportunity to cure the breach and a Release Event shall be deemed to occur;
- The JPA has exercised its right to maintain or engage a third party to maintain the Software; and
- The end of the initial I-680 Express Lane system support and maintenance term of the SI shall have occurred.

3.13.3 Release

Upon the occurrence of any Release Event, the JPA may direct the release of the Software Documentation from the Escrow and exercise its license rights under Sections 3.10.2 and 3.10.3.

3.14 INSURANCE REQUIREMENTS

The requiring of any and all insurance as set forth in these specifications, or elsewhere, shall be in addition to and not in any way in substitution for all the other protection provided under the Contract Documents.

No acceptance and/or approval of any insurance by the JPA shall be construed as relieving or excusing the SI, or the Surety issuing its Bonds, from any liability or obligation imposed upon either or both of them by the provisions of the Contract documents.

The SI shall at all times during the term of this Contract maintain in full force and effect the policies of insurance required by this Section. At least annually, the SI shall provide to the JPA and the State evidence of the required insurance coverage and, if requested by the JPA, shall provide certified true copies of any and all of the policies of insurance.

The SI shall not commence work under this Contract until all of the insurance required under this Section has been obtained and approved by the JPA and the State, nor shall the SI allow any subcontractor to commence work on its subcontract until the insurance required of the subcontractor(s) has been obtained and approved. Prior to the start of work, the SI shall submit to the Contracts Administrator a certificate of insurance indicating that it has obtained the required coverage.

All insurance policies required by this Section, or elsewhere in the Contract Documents, shall be so endorsed as to provide that the insurance carrier will be responsible for giving notice to the JPA and the State in the event of cancellation or material modification of the insurance policy by either the insurance carrier or the SI, at least sixty (60) days prior to any such cancellation or modification.

The SI shall purchase and maintain, during the life of the Contract, the insurance that is described below in Sections 3.14.1 through 3.14.5.

3.14.1 Workers' Compensation

The SI shall maintain Workers' Compensation insurance as required by the laws of the State of California, and shall include Employer's Liability coverage with a minimum limit of \$1,000,000.

3.14.2 Comprehensive General Liability Insurance

The SI shall maintain occurrence forms of general liability insurance covering the full scope of this contract with limits of not less than \$1,000,000 per occurrence and \$5,000,000 aggregate for

personal or bodily injuries, and \$5,000,000 per occurrence and aggregate for property damage. A combined single limit per occurrence of \$5,000,000 with a combined aggregate of \$10,000,000 is acceptable. Such insurance shall include, but shall not be limited to, Comprehensive Broad Form Endorsement covering the following:

- a. All premises and operations;
- b. Products/completed operations;
- c. Independent contractors;
- d. Contractual liability covering oral or written contracts or agreements, including this contract;
- e. Additional interests of employees;
- f. Extended definition of bodily injury;
- g. Personal injury coverage (hazards A, B, and C), with no exclusions for liability assumed contractually or injury sustained by employees of SI; and
- h. Broad form property damage.

3.14.3 Comprehensive Business Automobile Liability Insurance

The SI shall maintain comprehensive business automobile liability insurance covering the use of any motor vehicle to be used in conjunction with this Contract, including hired automobiles and non-owned automobiles, providing not less than the following limits:

- \$1,000,000 Bodily Injury each person;
- \$2,000,000 Bodily Injury each occurrence; and
- \$1,000,000 Property Damage each occurrence.

A combined limit of \$3,000,000 each occurrence is acceptable.

Loading and unloading of any motor vehicle must be covered by endorsement to the automobile liability policy or policies.

3.14.4 Umbrella Liability Insurance

The limits of liability set forth in sections 3.14.1, 3.14.2 and 3.14.3, may be provided solely by individual policies, or in combination with an umbrella liability insurance policy which provides coverage at least as broad as the individual underlying policies. If an umbrella policy is purchased, each of the policies specified in the above referenced three sections shall be listed as underlying coverage in the umbrella policy.

3.14.5 Other Requirements

In addition to the above requirements, all insurance policies required by this section:

- (1) Shall name the JPA, ACCMA, BATA and Caltrans, and their respective officers, directors, employees and agents as additional insureds, and evidence of the same

- shall be provided by proper additional insured endorsements signed by the insurance agent(s) or authorized representative of the insurance company issuing each such policy (not applicable to Worker's Compensation coverage);
- (2) Shall contain provisions or endorsements necessary to assure coverage of claims by one insured against another;
 - (3) Shall contain endorsements providing that the SI's policies shall be primary to all other insurance available to the JPA, ACCMA, BATA and Caltrans for liability arising out of or resulting from the SI's operations under the Contract; and
 - (4) Shall be issued by reputable insurers authorized to issue such policy or policies in the State of California.

The SI shall require all architects, engineers and consultants hired as subcontractors for the design of the Express Lane system and facilities, to indemnify and save harmless the SI and the JPA, ACCMA, BATA and Caltrans from and against any and all claims, suits, judgments, expenses, actions, damages and costs of every name and description, arising out of or resulting from the performance of the services of the architect, engineer or consultant under the subcontract. Each architect, engineer and consultant shall be required by the SI to carry professional liability insurance in the amount of at least \$2,000,000.

3.15 BID/PROPOSAL AFFIDAVIT

All proposals submitted by Bidders must be accompanied by a completed Bid/Proposal Affidavit. A copy of this affidavit is included with this RFP.

3.16 CONTRACT AFFIDAVIT

All Bidders are advised that if a contract is awarded as a result of this solicitation, the successful Bidder shall be required to complete a Contract Affidavit. A copy of the affidavit is included with this RFP for informational purposes. This affidavit need not be submitted with the Bidder's proposal.

3.17 LIQUIDATED DAMAGES

Time is of the essence under this Contract. In the event the work is not satisfactorily completed in accordance with the Contract, damage will be sustained by the JPA. In such event, the SI shall pay to the JPA as liquidated damages the amount of \$1,000 per calendar day for each day's delay beyond the Contract completion date for I-680 Express Lane System commissioning, which shall also include the system design, development, integration, installation and testing of the ETS, including the interface to the Bay Area Toll Authority (BATA) Regional Customer Service Center (RCSC) and the Caltrans Traffic Management Center (TMC).

The assessment of liquidated damages by the JPA against the SI does not supersede the right of the JPA to impose other remedies available to it including, but not limited to, reductions in or withholding of payments to the SI.

In addition to any other remedies available to it in law or under the Contract, in the event that the SI fails to provide the services, equipment, or other items required for performance of the Contract within the prescribed time limits, the JPA may elect to provide or obtain services, equipment, or other items necessary to perform under the Contract. In that event, the SI shall pay the total cost incurred by the JPA for obtaining replacement services, equipment and other items necessary to a fully functional I-680 Express Lane system. The JPA shall have the unilateral right of source selection when the SI is unable to perform. In addition to the replacement costs described above, the SI shall also be required to pay the liquidated damages set forth above for any delay in performance as well as other damages sustained by the JPA.

3.18 INCORPORATION BY REFERENCE

All terms and conditions of the RFP and amendments thereto; all provisions of the Bidder's proposal and submittals in response to the RFP, and amendments thereto; all applicable state and federal laws, statutory and regulatory provisions and orders, are incorporated by reference and made a part of the Contracts to be entered into as a result of this RFP.

3.19 RETENTION OF RECORDS AND AUDITS

The SI shall retain all books, records and documents including, but not limited to, cost or pricing data relating to the Contracts, for a period of at least three (3) years after the date of final payment by the JPA hereunder or any applicable statute of limitations, whichever is longer, and shall make them available for inspection and audit by authorized representatives of the JPA, including the ACCMA Contracts Administrator or his/her designee, at all reasonable times.

The JPA may audit, at any reasonable time during the record retention period, the SI's books and records relating to:

- a. Cost or pricing data submitted by the SI; and
- b. The determination by the JPA of the SI's costs or estimated costs in connection with any change order or contractual modification, or proposed change order or contractual modification; and
- c. Matters involving claims by one party against the other.

The SI shall include these provisions in every subcontract.

3.20 CONTINUITY OF SERVICES

The SI recognizes that the services under this Contract must be continued without interruption and that, upon Contract expiration or termination, a successor, either the JPA or another contractor, may continue them. The SI agrees to exercise its best efforts and cooperation to effect an orderly and efficient transition to a successor.

The SI shall, upon the JPA ED's written notice:

- (a) Furnish phase-in, phase-out services for up to 90 days after this Contract expires; and

(b) Negotiate in good faith an agreement and plan with a successor to determine the nature and extent of phase-in, phase-out services required.

The plan shall specify a training program and a date for transferring responsibilities for each division of work described in the plan, and shall be subject to the ED's approval. The SI shall provide sufficient experienced personnel during the phase-in, phase-out period to ensure that the services called for by this Contract are maintained at the required at the required level of proficiency.

The SI shall allow as many personnel as practicable to remain on the job to help the successor maintain the continuity and consistency of the services required by this Contract. The SI also shall disclose necessary personnel records and allow the successor to conduct on site interviews with these employees. If selected employees are agreeable to the change, the SI shall release them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.

3.21 PROMPT PAYMENT OF SUBCONTRACTORS

The SI is responsible for making timely payments to all subcontractors and suppliers as required by the provisions of Section 7108.5 of the Business and Professions Code.

This Contract requires the SI to make payment to all subcontractors within 10 days of receiving payment from the JPA.

Each month, the Systems Manager will review the current pay items with the SI and all involved subcontractors to ensure that all work satisfactorily completed within specifications is included in the monthly progress payment. For payment purposes, the same quantity totals used to compute the payment to the SI will be the basis for payment to the subcontractor.

If the subcontractor does not receive payment within the required 10 days, the Subcontractor shall notify the Systems Manager, in writing, of the amount in dispute including the item numbers and payment quantity for each. The Systems Manager shall then notify the JPA ED of the dispute. The ED, or his/her designee, will endeavor to verbally contact the SI within 48 hours to ascertain whether or not a performance dispute exists which necessitates non-payment to the subcontractor. If a performance dispute exists, the SI must demonstrate that there is a valid basis to withhold payment from the subcontractor.

If the SI withholds payment from a subcontractor, the SI shall provide to the subcontractor written notice of the withholding of payment. The notice shall detail the reasons for withholding payment as well as the amount. A copy of the notice shall be provided to the Surety and the JPA. If no valid dispute exists, the SI will be directed to make immediate payment to the subcontractor. The subcontractor will be responsible for notifying the Systems Manager if this payment is not made. Upon receipt of notification, the JPA ED will schedule a meeting with the SI and subcontractor to verify and discuss the non-payment issue. This meeting will be held at the JPA's offices within 2 working days of the JPA's contact with the subcontractor. If it is determined that the SI has withheld payment to the subcontractor without cause, further progress

payments to the SI will be withheld until the subcontractor is paid. In addition, the JPA may order a suspension of work or other administrative actions as it sees fit.

If an action is taken as stated above, the SI shall notify the Systems Manager when payment is made. After the Systems Manager verifies that payment has been made to the subcontractor the JPA shall release withheld progress payments.

Nothing in this Special Provision shall be construed to prevent the subcontractor from pursuing a claim with the surety under the SI's payment bond at any time.

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4. PROPOSAL REQUIREMENTS

4.1 TECHNICAL PROPOSAL

Presented below are the various requirements that need to be adhered to as Bidders develop their Technical Proposal.

4.1.1 Letter of Transmittal

A letter of transmittal on the Bidder's official letterhead, not to exceed three (3) typed pages in length, shall be included at the front of the Proposal. The letter of transmittal shall be signed in ink by a duly authorized representative of the Bidder.

The letter should briefly introduce the proposed project team. The letter shall provide the name, title, address, phone number, facsimile number and e-mail address of the person designated by the Bidder to serve as a contact during the selection process.

A statement shall be provided that reflects that the Bidder fully comprehends the nature of the tasks involved in the Scope of Work, and accepts full responsibility, if selected for the award of a contract, for the completion of all of the work required, within the proposed schedule.

4.1.2 Qualifications of Bidder

The Bidder shall set forth his understanding of what work is to be accomplished. Specific reference must be made to the project requirements, the specifications applicable to the Express Lane Project, and all other required criteria. The general system requirements should be summarized sufficiently to demonstrate the Bidder's understanding of the products expected. However, a recopying of the project requirements, as described in this RFP, is neither necessary nor desirable. Special requirements of the project should be discussed and any unique circumstances should be presented. The project should be reviewed in the field, and any resulting conclusions presented.

4.1.2.1.1 General Corporate Description

The Bidder shall provide a general description of the corporate organization, the management structure, and the capabilities of the Bidder itself and/or of each of any joint venture participants, and of all major subcontractors. This shall include, for each firm, an overview of the organization, its history, general business purpose, parent company if appropriate, major divisions or subsidiaries, locations of offices, number of employees, etc.

4.1.2.1.2 Personnel

The Bidder shall identify each firm and the key persons that will be involved in and committed to the planning, design, construction, installation, integration, and implementation of the Express

Lane system to be provided under the Contract, including the management of the JPA customer service center staff. Personnel shall be listed by position, education, experience, the role they will play and the percentage of their time that will be devoted to this contract. Resumes shall be provided with sufficient information to permit the JPA to evaluate each person's ability to contribute to the overall effort. The Bidder shall also identify its proposed Project Manager (PM).

Resumes shall list directly related and general experience of all key personnel who are anticipated to be most responsible for performance of work on the project. All key personnel shall be identified on a proposed organizational chart. Each resume should not be more than two (2) pages in length.

4.1.2.1.3 Project Experience and Ability

The Bidder shall furnish documentation of its own, and its major subcontractors', experience in the planning, design, construction, installation, integration, implementation, maintenance and operation of HOT Lane systems, as well as its experience pertaining to the integration with other electronic toll collection back office service center operations. The experience statement shall include the Bidder's past experience and present contracts, and provide details on system hardware and software utilized, facilities management, system operations, system maintenance, customer relations, fiscal management and any other appropriate information related to the development, implementation and operation of the programs.

The descriptions should indicate any significant similarities and differences to those system(s) and the technical services that are described in this RFP. Information must be provided as to whether the contracts were completed on time and within budget or, if the contracts are ongoing, whether the contracts are on schedule and within budget. The Bidder shall also furnish the name, title, address, phone number and e-mail address of persons who may be contacted by the JPA for verification of the information provided. Information for up to seven (7) relevant HOT and tolling system related projects shall be included. Each project description should be no more than 1-page in length.

4.1.2.1.4 Financial Capability

The Bidder, and major subcontractors, shall provide evidence of the firm's financial condition, sufficient in detail to demonstrate its ability to perform all the proposed services. The submission must include audited financial statements, including all schedules, notes and the opinion, of the independent accounting firm, for the three most recently completed fiscal years. The statements must represent the entity submitting the proposal which will be responsible for the performance of all services, not a subsidiary or parent of the Bidder. The Bidder and subcontractors shall include evidence of their ability to provide the required bonding and insurance. Bidders and subcontractors may provide interim financial information, with a statement attesting to the accuracy of the information signed by the Chief Financial Officer (CFO) of the firm, if such interim information is necessary to provide all of the information required by the JPA.

4.1.2.1.5 Identification of Proposed Subcontractors

The Bidder shall identify all major subcontractors planned to be utilized in all tasks of the Contract, including, engineers, construction firms, consultants, equipment suppliers, computer systems suppliers, software developers or any other firms who will play a significant role in the project. The information furnished shall include a description of the work to be performed by each subcontractor, and the percentage of the total effort that the work represents.

The Bidder shall also provide identification of all Disadvantaged Business Enterprises (DBE) which will be participating in the contract, including an identification of the portion of the work that each will perform, and the percentage of the contract that the work represents.

The ACCMA has adopted a Small Business Enterprise (SBE) Policy, pursuant to which ACCMA encourages all Bidders to utilize qualified SBE subcontractors on ACCMA projects, ACCMA promotes the direct purchase of goods from qualified SBEs by utilizing SBE vendors when such vendors are available and the cost of the goods sought is reasonable, and, for professional services contracts, ACCMA seeks the utilization of qualified SBEs when such SBEs are available. All SIs are required to report on SBE usage during the term of the contract, using a form provided by the ACCMA.

For purposes of ACCMA's SBE Policy, an SBE shall be a "small business" within the meaning of 13 CFR Part 121 and California Government Code Section 14837. In the event that ACCMA's SBE Policy conflicts with any Federal, State or other funding source's programs, policies, regulations or requirements, ACCMA shall make the SBE Policy consistent with said funding source's programs, policies, regulations and requirements to the extent permissible by law. ACCMA's SBE Policy is neutral as to race, ethnicity, national origin, age, sex, religion, sexual orientation and other protected classes.

ACCMA has also adopted a Local Business Enterprise (LBE) Policy, pursuant to which ACCMA encourages all Bidders to utilize qualified LBE subcontractors on ACCMA projects. ACCMA promotes the direct purchase of goods from qualified LBEs by utilizing LBE vendors when such vendors are available and the cost of the goods sought is reasonable, and, for professional services contracts, ACCMA seeks the utilization of qualified LBEs when such LBEs are available. All Bidders are required to report on LBE usage during the term of the contract, using a form provided by the ACCMA.

4.1.3 Work Plan

4.1.3.1 General Description

A detailed overall description of the proposed ETS, including any drawings, sketches, charts, graphs and written narrative required to illustrate the system design, development, implementation, maintenance and operation, and to support the logic and methodology used by the Bidder to arrive at the proposed design shall be provided. Presented to Bidders, in the appendix to this RFP, is an I-680 Express Lane Concept of Operations document that conveys the JPA's project description and operational requirements.

4.1.3.2 Organizational Chart

An organizational chart for the project showing the PM and key personnel, the firm they work for and their project responsibilities shall be provided. The chart shall be accompanied with explanatory text. The particular advantages of the structure chosen should also be described.

The PM will not be required to reside locally to the project area. However, the key personnel in charge of installation (e.g. Installation Manager) will be required to be on-site during the period of installation and during transition to the warranty period. The Maintenance Manager will also be required to reside locally to the project area during warranty and any subsequent maintenance period options.

4.1.3.3 Management and Work Plan

A proposed management and work plan, including, but not limited to, details for overall and day-to-day project management; management controls and procedures for all tasks of the project; staffing progress reporting, budget tracking, etc. shall be provided by the Bidder. An overview of the various work tasks and how they are to be accomplished, descriptions of the tasks that will be subcontract, and to whom they will be subcontracted shall also be provided in the Work Plan.

4.1.3.4 Accomplishment of Project Requirements

The Bidder shall individually address the requirements of Section 6 - Project Requirements, which sets forth the proposed methodology, techniques and processes to be utilized to accomplish project implementation, warranty and maintenance.

As part of the proposal the Bidder shall provide a requirements trace matrix which demonstrates that each requirement of the RFP has been met by the proposal, including any exceptions or deviations.

In addressing Sections 6.2 through 6.8 of the Project Requirements, a complete listing of the types and quantities of all equipment shall be provided, including all hardware, including computer hardware, and software, specifying for each item the manufacturer, model number, full description and warranty information. Product information that would assist in review and evaluation of the proposal shall be included in the proposal as an appendix.

Proposed Quality Assurance and Quality Control (QAQC), Reliability, and Testing Programs shall be described in sufficient detail in the Work Plan. The Reliability Program shall include Mean Time Between Failure (MTBF) commitments for the primary system components included in Sections 6.2 Roadside Equipment Requirements and 6.7 Communications Network.

An ETS Project Schedule including all of the milestones that are presented in this RFP shall be included in the work plan. The proposed project schedule shall be one that the Bidder believes to be realistic and attainable. A Critical Path Method (CPM) or similar type chart shall be prepared with supporting text.

A description of the proposed Maintainability Program and Operations Program shall be included in the work plan for maintenance, operations and warranty requirements.

No cost information shall be included in the technical proposal. Inclusion of cost information in the technical proposal may result in disqualification of a proposal from consideration for award.

4.1.4 Technical Alternatives

In response to this section, the Bidder may present a technical description of options that it wishes to present to the JPA for inclusion in, to supplement or to replace elements of its basic proposal. This opportunity is open only if the Bidder has made an acceptable basic proposal that is fully responsive and in compliance with the requirements of the RFP.

If the Bidder elects to propose technical alternatives, the Bidder shall present the proposed alternative approach in response to this section in a clear and concise manner and identify why the alternative is being proposed and why the JPA would benefit from such an alternate solution.

The JPA reserves the right to either accept or reject any and all technical alternatives that are proposed.

4.1.5 Product Information

Product information such as brochures and product specifications that would assist the JPA in review of the Bidder's proposal evaluation of the ETS solution shall be included in the proposal as an appendix. Extraneous or advertising information that is not helpful in understanding the Bidder's proposal is not desired. The Appendix should preferably be bound in a separate volume and be limited in size.

Each Bidder shall enclose with its Technical Proposal the required Bid/Proposal Security in the amount stipulated in this RFP.

4.2 COST PROPOSAL

Each Bidder shall submit an original and five (5) copies of a Cost Proposal for this RFP on the forms provided subsequently in this document. The JPA reserves the right to reject in whole or in part offers containing unbalanced or unreasonable cost proposals for any item(s). The Bidders shall clearly state in their Cost Proposal that the presented program costs are valid for a period for 90 days. The JPA reserves the right to request that Bidders extend their proposed costs for 30-day periods, if necessary.

4.2.1 Project Cost Alternatives

The Bidder may present pricing options that it wishes to present to the JPA for inclusion in, to supplement or to replace pricing elements of its basic proposal. This opportunity is open only if the Bidder has made an acceptable basic pricing proposal that is fully responsive and in compliance with the RFP.

If the Bidder elects to propose pricing alternatives, the Bidder shall present the proposed alternative pricing approach in response to this section in a clear and concise manner and identify why the alternative is being proposed and why the JPA would benefit from such an alternate solution.

The JPA reserves the right to either accept or reject any and all pricing alternatives that are proposed.

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5. PROPOSAL REVIEW, EVALUATION AND SELECTION PROCESS

5.1 PROPOSAL EVALUATION AND SELECTION COMMITTEE

All qualifying proposals received by the submission deadline will be evaluated by an Evaluation Committee (Committee) appointed by the Executive Director (ED) of the JPA, or his/her designee. The Committee may seek the advice of others in reviewing the Proposals received, including but not limited to consultants and other advisors. However, the Committee will be solely responsible for evaluating the Proposals received and for rendering a collective final recommendation to the JPA.

5.2 EVALUATION CRITERIA

The criteria that will be used by the Committee for its evaluation of each qualifying technical proposal are listed below. Factor number 1 is the most important. Factors numbered 2 through 5 are slightly less important, and are approximately equal to each other in value.

1. The qualifications of the Bidder to perform the work required under the contract, including the following factors.
 - The overall management background and experience and the technical competence of the firm to plan, design, manufacture, construct, install, integrate and implement a HOT lane system of the type required by this RFP.
 - The qualifications of the principal persons that are proposed to be involved in the planning, design, development, manufacturing, equipping, construction, installation, integration and implementation of the Express Lane System covered by this RFP.
 - The direct experience of the Bidder's management and technical staff in the successful planning, design, development, manufacturing, equipping, construction, installation, integration and implementation of HOT Lane systems.
 - The financial capacity and capability to perform all the work required under the Contract, and the ability to provide the required bonding, insurance and indemnification to the JPA.
 - The perceived ability of the SI and its subcontractors to complete all of the required work in full accordance with the requirements of the RFP and in the time schedule offered in the proposal.
2. The Committee's perception of the ability of the Express Lane System proposed by the Bidder to perform in accordance with the design objectives specified in this RFP, and to the satisfaction of the JPA.

3. The proposed design of the system, with emphasis on quality, durability, efficiency, safety, appearance, ease and economy of maintenance, suitability for the intended use, and overall conformance with the requirements of the RFP will be taken into account by the Committee.
4. The quality, durability and capability of the equipment, software and systems proposed; the methods proposed to minimize downtime and to maintain satisfactory results over the life of the contract.
5. The overall quality of the Bidder's proposal for the project, including but not limited to the Bidder's comprehension of the JPA's requirements; the completeness, depth and clarity of the information provided; the Bidder's approach to the various aspects of the development and installation of the system; and its commitment to delivery of the project in accordance with the requirements of the RFP.
6. The evaluation of the Bidder's technical proposal may be affected by the Bidder's oral presentation and response to various questions that are posed by the Committee. However, oral presentations may not be required by the Committee in order to make its determinations and recommendations.

Presented below as Figure 1 is a preliminary Technical Proposal evaluation matrix. An evaluation matrix similar to this one will be completed for each Technical Proposal that is received from Bidders.

TECHNICAL PROPOSAL		Weight	<Firm #1>		<Firm #2>		<Firm #3>	
			Grade	Product	Grade	Product	Grade	Product
1.a	Overall Qualifications of the Firm to implement the ETS			0.000		0.000		0.000
1.b	Qualifications of Key Personnel			0.000		0.000		0.000
1.c	Project Manager's Experience			0.000		0.000		0.000
1.d	Financial Capability - Satisfy Bonding, Insurance and Indemnification Requirements			0.000		0.000		0.000
1.e	Ability to Complete the Work on schedule			0.000		0.000		0.000

2	Conformance with the Design Objectives			0.000		0.000		0.000
3	Quality, Robustness, and Suitability of Proposed System Design			0.000		0.000		0.000
4	Features and Procedures to Maximize Reliability of Hardware and Equipment			0.000		0.000		0.000
5	Overall Quality and Clarity of Proposal			0.000		0.000		0.000
6	Strength, Clarity, and Soundness for Transition			0.000		0.000		0.000
	TECHNICAL SCORE	100		0.000		0.000		0.000

Figure 1 – Technical Proposal Evaluation Matrix

5.3 QUALIFYING PROPOSALS

The Contracts Administrator will initially review each Technical Proposal for compliance with the instructions contained in this RFP, any addendum and with any other procedures required in conducting this procurement. Failure to comply with any requirement may disqualify a Bidder's Proposal from consideration by the Committee. Each Bidder must assume full responsibility for meeting the requirements of the procurement.

5.4 TECHNICAL EVALUATION

After the Contracts Administrator selects the qualifying proposals, the Committee will conduct an evaluation of the technical merit of each qualifying proposal. This evaluation will be made on the basis of the evaluation criteria as set forth above in Section 5.2 above. This step of the overall Proposal evaluation may include verification of credentials and stated experience and the Bidder authorizes the JPA to inquire as it sees fit.

Proposals which have been found by the Committee to be non-responsive to the technical requirements of the RFP may be considered ineligible for further consideration at and from this point in the evaluation process.

As part of the technical evaluation, the Committee may require those Bidders whose proposals are initially classified as reasonably considered for being selected for award to appear before the Committee to make oral presentations, to answer questions and/or to provide clarification on their proposals. The individual identified as the PM in the Bidder's Proposal will be expected to play the primary role in the Bidder's interview and presentation.

The Committee will also conduct reference checks of Bidders at this time. The purpose of the reference checks will be to determine the level of satisfaction and quality of service provided to Bidder's present and/or past clients in the areas of general system performance; technical integration; compliance with implementation plans and budgets; general responsiveness; customer satisfaction; and contract compliance.

5.5 COST PROPOSAL EVALUATION

Separately, and after completion of the Technical Proposal evaluation, the Contracts Administrator will unseal the Cost Proposal of each qualifying Bidders. The Committee shall then perform a thorough evaluation and tabulation of the cost information contained in each Bidder's Cost Proposal.

5.6 COMBINED EVALUATION

The Committee will then rank the Bidders based on the combination of their Technical and Cost Proposals. In determining the final ranking of proposals, technical merit might be given more weight than the proposal cost. The JPA will evaluate proposals and choose the preferred Bidder not necessarily based upon the lowest cost, but based upon the determined best value to the agency.

5.7 BAFO EVALUATION

If the JPA chooses to utilize the BAFO process, the Committee will evaluate the received BAFOs from those Bidders that are requested to submit one. The BAFO evaluation will be combined with the basic proposal evaluation as part of the SI selection process.

5.8 RECOMMENDATION FOR AWARD

Following completion of the proposal evaluation process and discussions or negotiations with the Bidders, if any, the Committee will make a recommendation to the JPA for award of the contract to that responsible Bidder whose proposal is determined to be the most advantageous to the JPA. Award of a contract, if any, is subject to the approval of the JPA upon the recommendation of the ED, and to such other approvals as may be required by State law, including the California Board of Public Works.

5.9 PRE-AWARD AUDIT

TBD

5.10 PROTESTS

TBD

6. PROJECT REQUIREMENTS

6.1 GENERAL REQUIREMENTS

Presented in the Appendix of this RFP is a copy of the ETS System Requirements document. If there are any differences between the requirements presented in this RFP and the System Requirements document, the RFP shall govern.

6.1.1 Life, Reliability, and Availability

The ETS, with appropriate maintenance, shall be sized and designed for a minimum ten-year usable life.

Each major part of the ETS shall meet or exceed the specific Mean-Time-Between-Failure (MTBF) and Mean-Time-To-Repair (MTTR) criteria that are listed below in Table 1.

Table 1 - Equipment MTBF and MTTR

Equipment	Minimum Mean Time Between Failures	Maximum Mean Time To Repair
Tolling Zone Controllers	12,000 hours	1 hour
ETC Reader/Antenna	20,000 hours	1 hour
Vehicle Detector Loops	10,000 hours	2 hours
RTMS Equipment	20,000 hours	2 hours
Mobile Enforcement Readers	15,000 hours	1 hour
Hand Held Enforcement Devices	15,000 hours	1 hour
Tolling Zone Beacon	15,000 hours	1 hour
Local Area Network	20,000 hours	1 hour
Wide Area Network	20,000 hours	1 hour
All Supplied Standard Workstations	10,000 hours	1 hour
TDC Computer System	10,000 hours	1 hour

MTTR is based on average repair times for typical system failures.

6.1.2 Hardware Requirements

System Life- The system design shall ensure a ten (10) year minimum system life. Equipment shall be designed, fabricated, and tested to ensure that it operates satisfactorily without material degradation for a minimum of ten years. Expendable and consumable materials and supplies will not be included in this requirement.

New Equipment- All equipment, supplies, and materials for this system shall be new and unused, when installed. Materials and products which have been previously used for development work, leased systems, or any other type of used equipment, will not be permitted.

Modular Design- Modular design principles shall be used throughout the system, and shall be defined as the packaging of components together in replaceable units according to the function they perform and by using standardized hardware and components to achieve flexibility of use and to facilitate maintenance. Replaceable and repairable modules shall be used whenever possible to simplify troubleshooting, reduce downtime, and reduce operational and maintenance costs.

Accessibility- All assemblies, subassemblies, and modules shall be readily accessible for removal, testing or replacement without extensive removal of other modules or assemblies. Components shall be located so that there is visibility and access for the use of hand tools and standard test probes where maintenance is required.

Circuit Protection- Components and devices which are susceptible to damage upon failure of the regulating element within a power supply shall be protected by means of an over-voltage protective circuit. All fuses shall be mounted with retention devices at both ends. All fuse types shall contain visual indicators to indicate a blown fuse. The SI's design and recommendations shall conform to the applicable lightning protection, surge, and transient protection standards, such as NFPA-78, IEEE Std 587, and UL-1447, as they apply to each area of protection.

Housings and Cabinets- The material and finish for new housings and cabinets shall be environmentally resistant to outdoor highway environments with wide temperature fluctuations. A minimum of ten (10) years service without additional painting or repairs is required. All cabinets and housings shall be fitted with required gaskets, grommets, and filters to prevent dust, dirt, smoke, moisture or other contaminants from entering the enclosures in accordance with the application in which the equipment is employed.

Hardware- All mounting hardware, bolts, nuts, studs, washers, brackets, screws, hinges, and others shall be new and shall be constructed of non-corrosive material, and of a design to perform their respective functions for the specified ten (10) year system life.

Fabrication- All chassis, attachments, and hardware shall be fabricated from corrosion and rust resistant materials, or properly plated to achieve corrosion and rust resistance. For those housings and cabinets requiring locked covers, there shall be no exposed hardware visible or accessible from the outside. The covers shall fit flush with the main body of the housing with no exposed gaskets or seals visible when the cover is closed.

Stainless Steel Materials- The provision and fabrication of all stainless steel materials used in the system shall conform to current ASTM requirements. All welds shall be thoroughly cleaned to remove all oxide scale. Discoloration resulting from the welding process shall be removed from all external surfaces. All grinding, polishing and buffing shall be in accordance with the requirements of the material used.

Applicable Codes- All work for this Contract shall be in conformity with the current requirements of the following:

- § National Electric Code;
- § National Electrical Contractors Association (NECA);
- § Occupational Safety and Health Act (OSHA);
- § National Fire Protection Association (NFPA);
- § National Electrical Manufacturers Association (NEMA);
- § Institute of Electrical and Electronic Engineers (IEEE);
- § Applicable Electronic Industries Association (EIA) Standards for Interface and Intercommunication; and
- § Underwriters Laboratories (UL).

Equipment Diagnostic and Self-Test Requirements- Diagnostic firmware shall be embedded in the Tolling Zone Controller (TZC) and it shall be interactive with operation and to self-test at the time the equipment is powered on and/or throughout its operation. Diagnostics shall operate automatically to detect malfunctions and failures and to report such failures to the Maintenance On-Line Management System (MOMS) system at the time of occurrence. Diagnostic software shall be provided to evaluate all aspects of the TZC operation, including communications.

The system operation shall not be adversely affected by the presence of transponders issued by other facilities or organizations (whether or not they are from the same manufacturer).

The SI shall conduct an inter-modulation study at each roadside site prior to installation to ascertain that the ETS subsystem will not interfere with existing Caltrans radio equipment or other nearby sources of Radio Frequency (RF), and vice-versa. Should any such interference be identified, the SI shall take any required actions to protect the affected equipment or source to the complete satisfaction of the JPA at no additional cost to the Contract.

Working drawings, catalog information, or shop plans for all equipment in the system and all work to be permanently installed shall be submitted for approval in accordance with the State of California Department of Transportation Standard Specifications July 1999 and Standard Plans July 2004. The SI shall also be responsible to adhere to all other jurisdictional requirements.

6.1.3 Environmental Requirements

The ETS equipment shall be installed either outside or in a building. The assembled equipment shall be rated to perform under those environmental conditions at the various tolling zone sites.

The SI shall thoroughly investigate all environmental factors that may affect the operation, reliability, and life of the system to be provided under this Contract and shall select equipment

that is appropriate for operation in the environment or shall take adequate steps to protect the equipment from the environment.

For each environmental area the equipment installed or operated in that area the SI shall provide certified test results from a testing laboratory satisfactory to the JPA demonstrating that the equipment meets the environmental specifications as indicated below in Table 2.

Table 2 - Summary of Environmental Requirements

Area	Exterior	Building
Min operating temp	-20°F	50°F
Max operating temp	145°F	85°F
Min operating humidity	15%	15%
Max operating humidity	98%	80%
Shock	98% MIL-STD-810E Method 516.4 procedures IV	MIL-STD-810E Method 516.4 procedures IV
Vibration	±1g from 15Hz through 500 Hz for a period of 15 minutes in three planes.	None
Corrosion	IEC 68-2-11 or NEMA 4X enclosed	None
Electrostatic Discharge	Survives while booth testing	None
Rain	MIL-STD-810E Blowing rain method 506.3 procedure I or NEMA 4X enclosed	None
Dust	IEC-529/MIL STD-810 Sand and dust size smaller or equivalent to coal or salt or NEMA 4X enclosed	None

Certified results from prior testing by the manufacturer or an approved independent test lab may be used to satisfy the environmental qualification requirement.

6.2 ROADSIDE EQUIPMENT REQUIREMENTS

6.2.1 FasTrak® ETC Subsystem

The ETC subsystem, including the reader and antenna, deployed for the I-680 Express Lane system shall meet all California Title 21 requirements of the toll system operational requirement standards that are in place in the Bay Area at time of deployment of the I-680 Express Lane system.

I-680 Express Lane patrons will be issued FasTrak® transponders through the BATA RCSC, which is located in San Francisco. However, in the event that transponders are procured under this contract they shall be provided in accordance with all California Title 21 requirements utilizing a protocol for high-speed tolling. Additional transponders shall be identical in design and function to the FasTrak® transponder per the following:

- Shall be user installable/removable;
- Provide audible tone when the transponder is successfully read; and
- Provided with an RF shielding bag which would be utilized when the vehicle is traveling as an HOV.

6.2.2 Tolling Zone Controllers

The TZCs shall control and monitor the toll collection activities at each tolling zone and be primarily responsible for gathering FasTrak® transaction data and transmitting that information to the Toll Data Center (TDC), in a secure environment, and without duplication, for trip compilation. The lane controller shall also interface with the TDC to receive daily FasTrak® tag account status files on, at least, a daily basis.

6.2.2.1 Toll Zone Controller Primary Functions

The primary functions of the TZC shall be to:

- Create and transmit vehicle count and transponder read data;
- Provide visual feedback of possible violations, through the use of an enforcement beacon installed at the tolling zone in such a position that it can be easily viewed by CHP officers;
- Monitor its peripheral tolling zone equipment (i.e. FasTrak® reader, antenna, vehicle detection system equipment, etc) and report on the status of these pieces of equipment; and
- Receive daily transponder account status update files from the TDC.

The TZC shall accommodate a system administration and maintenance interface. This interface shall be used by operations and maintenance personnel to accomplish tasks such as modifying system configuration files, extracting transaction data, performing preventive maintenance tasks, etc.

The TZC shall be capable of storing no less than 30 days of vehicle, event and FasTrak[®] transaction data. The TZCs shall also store no less than 10 million FasTrak[®] transponder account status entries.

All TZC messages (i.e. vehicle, event, FasTrak[®] transaction, maintenance, etc.) shall contain a unique sequence number.

The TZCs shall include at least the following information in the transaction record:

- Transponder number;
- Transponder status;
- FasTrak[®] transaction date;
- FasTrak[®] transaction time;
- Transponder handshake count;
- Lane controller date;
- Lane controller time;
- All pertinent VDS data; and
- Equipment states.

The TZC's vehicle sequencing logic shall be self-correcting. The TZC shall record all transponders that are read by the FasTrak[®] tolling zone subsystem.

The TZC shall be able to operate normally without network communications, storing current records for later transmission to the TDC.

6.2.2.1.1 Equipment Monitoring and Control

The TZCs shall monitor the following peripheral equipment through real-time data connections:

- Vehicle detection system equipment;
- FasTrak[®] transponder reader;
- FasTrak[®] antennas;
- Enforcement beacon; and
- All other power supply and communications equipment that is located at the tolling zone.

The system monitoring functionality shall include the ability to receive maintenance status messages from all subsystems and it shall incorporate logical processes, local to the toll zone controller, which evaluate operations and create maintenance alerts based upon sets of rules and expected conditions.

The maintenance alerts that are generated by the toll zone controller shall be sent to the MOMS.

The MOMS shall be responsible for compiling the raw maintenance data into a database and creating maintenance alerts and work orders that define actual maintenance events that need to be addressed.

6.2.2.1.2 Lane Controller Data and File Transmission

The TZCs shall be connected to the TDC through an Ethernet connection and transmit files to the TDC server in real-time.

The toll zone controller shall transmit vehicle detection information, FasTrak[®] transaction data, equipment diagnostics and maintenance data.

The toll zone controllers shall receive, at a minimum, daily FasTrak[®] tag account status update files, system configuration files, and toll rate files.

The toll zone controller's serial ports shall be configurable as either RS-232 or RS-422.

Serial communications interfaces shall provide for error detection protocols.

6.2.2.2 Lane Controller Equipment Requirements

Under normal conditions, the TZC shall operate in an automated fashion without intervention from operational personnel.

All ETS functions, including but not limited to, transaction assembly, file transmission, and toll rate assignment shall be designed to function independent of human interaction.

The TZCs shall be environmentally hardened and housed in an environmentally shielded and controlled enclosure to operate under the weather conditions found in the Bay Area.

The TZCs shall be designed with discrete input and output signal lines and use optical isolation circuitry for protection.

The TZCs shall store data redundantly.

The TZCs shall provide for a local user interface for maintenance purposes.

The TZC data storage process shall be based on First in First out (FIFO) technology.

The TZC performance shall be ample to handle all lane processes as designed at a rate of 2,500 vehicles per lane per hour, with 50% of those vehicles having transponders.

For any 10 second period, the toll zone controller shall be capable of handling all Express Lane processes for transponder vehicle passage rates of 7,200 vehicles per lane per hour, assuming that all vehicles have transponders.

The tolling zone system shall capture transponder reads for 99.98% of the vehicles with properly mounted transponders passing through the tolling zone.

The tolling zone system shall capture transponder reads for less than 0.01% of the transponders traveling in the General Purpose (GP) lane closest to the Express Lane (left-most GP lane).

The tolling zone system shall be capable of determining the direction of travel for all vehicles in the Express Lane with an error rate in the determination of travel direction of no more than 0.01%.

6.2.2.3 Lane Controller Operating System

The TZC Operating System (OS) shall be robust enough to support all of the operations of the tolling zone subsystems while meeting all of the requirements stated in the RFP.

The OS of the toll zone controller shall function in such a way that it allows for the real-time collection and transmission of data across an Ethernet network as well as remote, real-time user connections (for maintenance purposes).

The TZCs shall provide TCP/IP network support and TCP utilities such as telnet, ping, and FTP.

6.2.2.4 Lane Controller Interface to the Toll Data Center

Each TZC shall maintain a real-time interface with the TDC. This interface shall allow for the transmission and reception, in real-time, of any data collected and assembled in the lane and any data compiled at the TDC which is necessary for tolling zone subsystem operations.

The TZC to TDC interface shall be fully automated and not require human intervention.

The TZC shall broadcast lane events in near real-time to the TDC to support the monitoring activities carried out by operations or maintenance personnel.

The TZCs shall transmit a periodic heartbeat, or status, message to the TDC for maintenance purposes.

If communication between the toll zone controller and the TDC fails, the TZC shall periodically and automatically attempt to re-establish the connection until the connection is made.

The TZCs shall periodically (at least daily) receive tag status files from the TDC. The TDC shall receive the tag status files from the BATA RCSC. Upon receiving tag status files from the TDC, the TZC software shall subject the file to various sanity checks to ensure that the file is valid prior to downloading the new data file into its static memory. Typical sanity checks would include checking the file type, the file size, the file header and footer data, etc.

The TZCs shall transmit an indicator of TDC-initiated command execution, for example transmission is successful, it has failed, etc.

6.2.2.5 Lane Controller Equipment Interface

All TZC interfaces to peripheral equipment shall incorporate means of detecting whether the equipment is operating properly or if it experiences malfunction.

6.2.2.5.1 Lane Controller Interface to the Vehicle Detection Systems

The interface between the TZCs and the Vehicle Detection System (VDS) equipment, at those locations in which this communications link is established, shall be in real-time.

The VDS data that is gathered shall consist of vehicle speed and traffic volume data (from the Express Lane) and travel time information from the GP lanes. The necessity of the accurate and timely exchange of data between the two systems is essential to successful dynamic pricing operations.

6.2.2.5.2 Lane Controller Interface to the FasTrak® Reader

The interface between the TZCs and the FasTrak® transponder reader shall be in real-time and not be encumbered by latency.

The bidirectional interface shall allow for the exchange of toll zone controller commands and FasTrak® system transponder data. The necessity of the accurate and timely exchange of data between the two systems is essential to successful ETS operations.

6.2.2.5.3 Lane Controller Interface to the Enforcement Beacon

The toll zone controller shall interface with the tolling zone enforcement beacon in real-time and immediately send the proper commands to the beacon when a valid FasTrak® transponder is detected and processed.

6.2.2.5.4 Uninterruptible Power Supply

The TZCs shall interface directly to Uninterruptible Power Supply (UPS) to ensure that battery power back-up is available to the controller if commercial power fails.

The use of UPS equipment shall also ensure that the TZC software is shut down in an orderly fashion if commercial power is not restored prior to the UPS battery power running out.

6.2.3 Vehicle Detection System Equipment

The primary functions of Express Lane VDS equipment shall be to accurately, and in near real-time, detect vehicles in the Express Lane to determine the traffic density and the speed of vehicles that are traveling in that lane.

6.2.3.1 Inductive Vehicle Detector Loops

Vehicle detection loops shall be installed in the southbound Express Lane at the locations identified in the Project Electrical Plans, a copy of which is provided in Appendix of this RFP. Installation of the loops shall be in accordance with all relevant Caltrans specifications.

Vehicle detection loops shall be of the inductive loop type with the ability to detect vehicles traveling at speeds ranging between 5 and 100 mph.

As is described in the I-680 Express Lane Communications Plan, a copy of which is presented in the Appendix to this RFP, the detection loops shall communicate directly with and provide real-time data to the TDC and, ultimately, to the dynamic pricing module/software for rate setting processing.

6.2.3.2 Remote Traffic Microwave Sensors

In order to collect travel time data from the GP lanes, Remote Traffic Microwave Sensor (RTMS) devices shall be installed along the outside GP lane. RTMSs shall be located per the Electrical Plans that are provided in the Appendix. Installation of the RTMS shall be in accordance with all relevant Caltrans specifications.

The RTMSs shall be capable of detecting vehicles from a “side-fire” type installation.

The RTMSs shall be capable of detecting vehicle volume, count and speed across all GP lanes and in the Express Lane at vehicle speeds between 5 and 100 mph. The RTMS units shall also determine in which lane the vehicles are traveling.

The RTMSs shall be configured to capture vehicles in the Express Lane in the event that a loop failure occurs thus allowing the RTMS units to be used as data back-up to the failed vehicle detector loop.

6.2.4 Dynamic Message Signs

6.2.4.1 Primary DMS Functions

The Dynamic Message Signs (DMS) shall be located approximately ½-mile upstream from each entry point to the southbound I-680 Express Lane and shall be the primary method of informing the public of what the toll rate will be if Single Occupant Vehicle (SOV) operators choose to use the Express Lane.

When the TDC trip processor calculates a toll rate for an entry point, the rate shall be communicated to the DMS controller utilizing the IP address for that DMS controller.

The DMS controller shall send the display message to the Light Emitting Diode (LED) panel, which will be mounted to the DMS.

The LED panel shall continuously interrogate itself and report back to the sign controller that the requested message is being properly displayed. The DMS controller shall then relay this information back to the trip processor software, which will be located at the TDC.

In addition to reporting what is being displayed on the DMS at the time of the rate change, the DMS shall be polled by the TDC at regular intervals (at least every 30 seconds) and shall in turn poll the LED panel and return the message being displayed for confirmation that the correct rate is being displayed.

6.2.4.2 DMS Equipment Requirements

The DMS shall be consistent with the Caltrans approved signage program.

The DMS sign shall include both static and dynamic portions.

The Express Lane DMSs shall combine static sign information panels with dynamic LED panels.

The static portion of the DMSs shall include displayed information that never changes (the Express Lane downstream exit points, restricted hours, FasTrak[®] logo, etc.).

The dynamic portion of the DMS shall include an LED panel attached to the sign that shall display the dynamically changing toll rates. This panel shall consist of at least 6 characters (alpha numeric) that are at least 12 inches in height.

The panel shall include an automatic feature that measures the ambient light and adjusts the intensity of the LEDs to be visible under all light conditions (full sun to full dark). In order to minimize the “halo” effect of certain colors, the LED color shall be amber.

The LED panel shall also include the ability for the sign to report to the TDC what is being displayed by interrogating the sign pixels.

The DMS shall be managed by a sign controller which will be located either in a weather hardened roadside enclosure or on the mounted sign.

The DMS controller shall communicate to the TDC’s trip processor via a communications network utilizing the National Transportation Communications for ITS Protocol (NTCIP) standard sets or, if allowed by JPA, Transmission Control Protocol/Internet Protocol (TCP/IP).

The DMS controller shall have a unique IP address that identifies its location.

6.2.5 Closed Circuit TV Subsystems

Closed Circuit Television (CCTV) cameras shall be deployed for traffic condition surveillance, monitoring of the tolling zones and for safety reasons. CCTV cameras shall also be used to assist Caltrans staff in detecting incidents and to track the progress of incident response and

vehicle clearance. Video from the CCTV cameras shall be sent to the TDC and TMC where it shall be made available to third parties over the Internet.

During normal operational periods JPA staff shall have control over the pan, tilt and zoom camera features and Caltrans staff shall have only view access. During emergency situations, control of the video shall be provided to TMC staff.

6.2.5.1 CCTV Camera Locations

The CCTV cameras shall be installed at locations according to the preliminary plans.

6.2.5.2 CCTV Subsystem Requirements

The CCTV subsystems shall include the following components:

- CCTV camera;
- Camera mounting pole;
- Pole foundation;
- CCTV control cabinet; and
- Video and communication components and cables.

CCTV cameras shall be able to turn 360 degrees and contain pan, tilt and zoom capabilities.

The CCTV subsystem shall use Ethernet-based communications and protocols.

6.2.5.3 Camera Assembly

Each camera assembly shall consist of the following fully integrated components:

- Solid state color camera;
- Zoom lens;
- Weatherproof camera housing;
- Pan and Tilt; and
- Camera mounting assembly.

The camera assemblies shall be assembled and tested in accordance with these specifications prior to delivery to Alameda County. Factory testing documentation shall be furnished to the JPA. Camera assemblies shall be furnished as a complete unit.

Individual components of the camera assembly shall conform to the specifications in the following sections.

6.2.5.4 Solid State Color Camera

Solid state Charged-Coupled Device (CCD) color cameras shall be provided, which shall meet or exceed the following requirements:

Color System	Phase Alteration Line (PAL) standard
Image Sensor	1/3" interline transfer, progressive scan CCD
Horizontal Resolution	Minimum 470 horizontal television lines
Sensitivity	3.0 lux @ 1/60 second (color day) 0.2 lux @ 1/4 second (color day) 0.3 lux @ 1/60 second (mono night) 0.02 lux @ 1/4 second (mono night)
Day/Night Switchover	Day (color) / night (mono), manual or auto
On-screen ID	Presets, Sectors and two alarms programmable (enable/disable)
Title Generation	8 lines

The camera shall be specifically designed to operate under low light conditions and shall function satisfactorily over a wide range of dynamic lighting conditions ranging from low light to full sunlight. To improve sensitivity under low light conditions, the camera may switch from full color to monochrome operation.

6.2.5.5 Zoom Lens

The camera lens shall be a motorized zoom lens meeting the following requirements:

Optical Zoom Range	Integral 23X optical (3.6 to 82.8 mm)
Digital Zoom range	1X through 10X digital
Auto focus	Selectable Auto/Manual

6.2.5.6 Waterproof Camera Enclosure

The cameras shall be furnished in waterproof enclosures. The enclosures shall be designed to ensure that the complete CCTV camera assembly operates satisfactorily and in compliance with the specifications in the meteorological and ambient conditions prevailing in the Bay Area.

The enclosure shall be weatherproofed and sealed. The enclosure shall protect against water, grime, dirt, sand and moisture.

The enclosure shall include an integral sunshield to reduce internal temperatures and minimize glare caused by direct sunlight.

6.2.5.7 Pan and Tilt

The camera assembly shall include remote controlled pan and tilt functions that, at a minimum, meet the following minimum requirements:

Pan	360 degrees continuous pan
Tilt	0 – 90 degrees down, Auto flip at 90 degrees
Presets	64
Preset speed	> 250 ° / second preset, at 0.1 ° accuracy
Tours	8, each of 32 presets with dwell time per preset per tour
Sectors	16
Privacy Zones	8 programmable zones can be set for video blanking
Digital position feedback	Yes

6.2.5.8 Camera Mounting Assembly

The cameras shall be installed on poles. The SI shall supply and install all necessary fixtures and fittings for mounting the camera assembly onto the poles and building rooftops. The camera mounting bracket shall be capable of supporting the weight of the camera assembly and shall be capable of withstanding winds with no appreciable movement for speeds up to the maximum design wind velocity as experienced in the Bay Area.

6.2.5.9 Pole Mounting Brackets

For pole mounted cameras, CCTV camera assemblies shall be provided with camera mounting assemblies, to mount cameras on CCTV poles.

6.2.5.10 Mounting Bracket Design

The SI shall be responsible for the design and construction of the mounting brackets and for conducting a field survey to determine the most suitable method of mounting the cameras. Shop drawings of the mounting method shall be submitted to the JPA for approval prior to manufacture of the camera mounting brackets.

6.2.5.11 Camera Cable

The SI shall furnish and install all necessary cables and connectors between the camera assembly and the outstation cabinet. Pole mounted camera cables shall be routed down the inside of the pole and through underground duct to the outstation cabinet.

6.2.5.12 Camera Control Receiver (CCR)

The SI shall furnish and install digital camera control receivers in outstation cabinets at each camera location. The control receivers shall respond to signals from the central camera control system and provide D/A conversion of camera control function commands. Output voltages from the CCR shall be as required by the camera assembly provided.

6.2.5.13 CCR Requirements

The CCR units shall transmit and receive bi-directional control signals to and from the TDC and the Caltrans TMC over the communications network, as specified in Section 6 above. The control receiver shall provide the drive signals to the camera, lens, and the pan and tilt functions, and transmit status information over the communications network to the TDC and the TMC for processing.

The SI shall furnish and install all necessary cables and connections between the CCR and the communications network.

The CCRs shall be fully compatible with the camera control software and the camera assemblies provided. At a minimum, the CCRs shall provide the following functions:

- Zoom in;
- Zoom out;
- Pan left;
- Pan right;
- Tilt up;
- Tilt down;
- Focus near;
- Focus far;
- Camera power on;
- Camera power off;
- Iris override;
- Iris open (manual/automatic); and
- Iris close.

Each CCR shall provide a means for the local control of the above functions. The control panel shall also include a main power switch, fuse and breaker, as well as “off” settings from zoom, focus, pan, tilt, and iris. The CCR shall provide video testing capabilities, to allow observation of the video signal from the camera in the field.

The CCR shall have eight (minimum) form “C” relays to activate auxiliary devices in the field. The CCR shall have eight (minimum) status inputs available to monitor conditions in the field, such as cabinet entry, loss of camera enclosure pressure, etc.

6.2.5.14 CCTV Cabinets

The CCTV cabinets may be used to house the CCR and other necessary equipment required for CCTV camera operations and maintenance, provided that it is located near enough to the CCTV camera and adequate space is available within the cabinet to facilitate maintenance operations.

If the SI determines that a separate cabinet is required to house the CCR, all costs associated with the cabinet shall be included in the cost of the CCTV subsystem. The location of any CCTV cabinets, if any, shall be subject to the approval of the JPA.

6.2.5.15 CCTV Communications Equipment

The SI shall furnish and install fiber-optic modems, cables and connectors, as necessary to provide transmission of the camera video signal from the outstation cabinet to the TDC and the Caltrans TMC and to provide two-way transmission of digital camera control signals and camera feedback data.

Video transmission shall meet all State and local standards. Control data shall utilize RS-422 serial interface and standard video industry control protocols.

CCTV communications equipment shall be provided in accordance with Section 6 of the RFP.

6.3 ENFORCEMENT EQUIPMENT REQUIREMENTS

In order to manage the traffic in the Express Lane using dynamic pricing, careful and efficient system enforcement is essential. Uncontrolled use of the Express Lane by unauthorized vehicles will cause overcrowding, disrupt the dynamic pricing process and jeopardize the success of the pilot project.

The I-680 Express Lane enforcement process will always include some type of visual monitoring to determine how many occupants are in the vehicles that are traveling in the Express Lane. Visual enforcement is performed by California Highway Patrol (CHP) officers observing driver behavior entering and exiting the Express Lane and determining if a transponder is visible on the windshield. Access to the Express Lane will be controlled through the use of triple painted lines (one white line and double yellow lines). Primary emphasis for enforcement will be reducing or attempting to eliminate the number of SOVs that use the Express Lane without a valid transponder and minimizing occurrences of vehicles crossing the double lines. However, it is presumed that all other typical traffic violations will also be enforced by the CHP in the southbound I-680 Express Lane corridor, including speeding, seat belt violations, etc.

Enforcement areas will be installed to assist CHP officers in the I-680 Express Lane enforcement process. As shown in Figures 1 and 2, a minimum of two 400-meter long by 4.8 meters wide enforcement zones will be deployed between approximate Stations 75+00 and 96+40 and between 24+00 and 58+40. Two other enforcement locations, one north of the Jacklin interchange and one north of the Mission 262 interchange, will provide 4.9 meter wide inside shoulders that will be approximately 400 meters in length. These inside shoulder areas are available to CHP officers to conduct enforcement of the Express Lane.

6.3.1 I-680 Express Lane System Enforcement Tools

The CHP will make use of the following four (4) enforcement tools, which will be provided to them and be maintained by the SI pursuant to the Contract:

- Mobile Enforcement Readers (MERs);
- Personal Display Assistant (PDA) units;
- Hand Held Devices; and

- Tolling Zone Beacon.

6.3.1.1 Mobile Enforcement Reader (MER)

The MER shall be comprised of a FasTrak[®] antenna that is mounted on CHP cars allowing an officer to determine whether passing vehicles are equipped with a transponder that is in good standing.

The CHP officers can either park on the shoulder of the road or be traveling along the corridor and query whether passing vehicles are equipped with a valid transponder by touching the screen of a PDA device which triggers an RF read signal burst in the direction in which the antenna is faced.

The MER antenna shall then attempt to detect a FasTrak[®] on-board device and, if it does detect a tag, compares the antenna ID number against the tag status file that is resident on the MER to determine whether or not the transponder is linked to a good FasTrak[®] account.

MERs shall permit Express Lane enforcement activities by CHP officers while traveling at highway speeds.

MERs shall allow CHP enforcement officers to confirm that an SOV is equipped with a transponder that is linked to an account that is in good standing.

6.3.1.1.1 MER Primary Functions

The MER shall provide the following functions:

- The MER shall be able to read a transponder and determine whether it is in good standing.
- The MER shall be able to read on-board transponders, at highway speeds, at distances of up to 75 feet.
- The MER shall operate in compliance with the Title-21 FasTrak[®] Dedicated Short Range Communications (DSRC) specifications, protocol and operating parameters.
- The MER shall detect on-board transponders within the operating requirements that are used by the FasTrak[®] readers and antennas that are installed at the Express Lane tolling zones.

6.3.1.1.2 MER Equipment Requirements

The MER shall be weather proof, hardened for use outside and suitable for use by CHP enforcement cars. The MER antennas shall be installed on CHP vehicles in such a manner that they do not interfere with any currently operating police equipment and/or functions.

The PDA display screen shall be visible under all lighting conditions and shall be easily reached by CHP officers without having to continually look down towards the unit.

Power to the MER antenna and reader shall be provided by the CHP vehicle's power source to ensure continuous use.

The MER installation of the FasTrak® antennas, readers and PDA devices shall be subject to approval by the JPA ED and the designated CHP representative.

6.3.1.2 PDA Display Unit

PDAs shall be used in support of both the MER and hand held enforcement devices.

The PDA shall provide CHP officers with readily accessible information on transponder identification numbers and related customer descriptive information.

The PDA shall also receive tag status downloads on, at least, a daily basis.

6.3.1.2.1 PDA Primary Functions

The PDA shall provide the following functions:

- The PDA shall receive tag status file data, which includes the daily updated list of the valid and invalid transponders as recognized by the BATA RCSC. This data shall be downloaded from the TDC when the PDA is connected to the Wide Area Network (WAN).
- The PDA shall also be able to receive and utilize tag status updates periodically throughout the day. This data shall be downloaded from the TDC to the PDA over a secure, high-speed wireless communications connection.
- The PDA shall contain software to compare a transponder's identification with the most current tag status file, which shall be resident on the PDA device, and determine if the detected transponder is linked to a FasTrak® account that is in good standing; and
- The PDA shall display information in an intuitive format that requires minimal interaction on the part of the user.

6.3.1.2.2 PDA Equipment Requirements

The PDA shall be small in size, weather proof, hardened for use inside and outside of the CHP vehicles and also suitable for use by CHP motorcycle officers in combination with the hand held device.

The PDA display screen shall be visible under all lighting conditions.

The PDA shall be able to receive data over a secure, high-speed, wireless WAN connection.

The PDA units that are mounted inside of the CHP vehicles shall be hard-wired to the vehicle power source to preclude the required use of battery power.

A rechargeable battery shall power the externally used PDA that allows use for up to 12 hours of continuous use.

6.3.1.3 Hand-Held Device

The hand held device shall allow the CHP motorcycle enforcement officers to confirm whether or not an SOV vehicle is equipped with a transponder that is linked to an account in good standing.

6.3.1.3.1 Hand Held Device Primary Functions

The hand held device shall provide the following functions:

- The hand held device shall be able to read a transponder and determine whether it is a linked to a FasTrak[®] account that is in good standing; and
- The hand held device shall operate within the FasTrak[®] Title-21 DSRC protocol and operating standards.

6.3.1.3.2 Hand Held Equipment Requirements

The hand held device shall be small enough in size, weather proof hardened for use outside and suitable for use by a CHP motorcycle officers.

6.3.1.4 Tolling Zone Beacon

The TZCs, which are located at each of the three (3) tolling zones, shall initiate a signal every time a tag read occurs when a transponder equipped vehicle traverses the tolling zone.

The beacon shall illuminate each time a tag is read and it is determined to be a valid FasTrak[®] transaction.

This verification shall be made automatically by the toll zone controller by linking the transponder to the FasTrak[®] account and confirming that it is an account in good standing.

6.4 TOLL DATA CENTER SYSTEM REQUIREMENTS

The TDC shall function as the central and primary logical unit for the I-680 Express Lane system.

The TDC shall interface with the following ETS components that comprise the Express Lane system:

- Tolling zone lane controllers;
- Dynamic toll rate displays installed as part of each DMS;
- System enforcement equipment used by the CHP;
- The Caltrans Traffic Management Center;
- The BATA Regional Customer Service Center;
- The JPA I-680 Express Lane website link;
- The JPA I-680 Express Lane system operations center, including the Customer Service Representatives (CSR) and system operator workstations; and
- Other future HOT Lane TDCs in Alameda County.

6.4.1 Primary Functions of the TDC

6.4.1.1 Traffic Demand Pricing Calculation

The TDC shall periodically and dynamically calculate the toll rate based upon Express Lane and General Purpose Lane traffic speed and density information. Traffic data shall be collected from the Express Lane via standard Caltrans double-loop electromagnetic VDSs that will be installed in the Express Lane approximately every mile along the 14-mile southbound I-680 Express Lane facility.

To ensure that toll revenue maximization occurs and to effectively cover the entire roadway, RTMS devices shall be installed on the outside roadway approximately every mile along the southbound I-680 Express Lane corridor, as well as at least one point upstream and at least one point downstream from the I-680 Express Lane corridor. RTMS equipment shall be used to collect travel time and vehicle density data from the GP lanes and shall also be used as back-up for the loops that will be installed in the Express Lane to collect traffic density and speed information.

The TDC shall collect traffic density and travel time data at a minimum interval of every 15 seconds. The actual time interval of collection of this roadway vehicle data by the TDC shall be determined by the ETS Systems Integrator during the system design process.

The toll calculation shall effectively maximize toll revenues for the upcoming tolling interval subject to the following constraints:

- The toll shall not be less than the user-specified minimum toll amount.
- The toll shall not be more than the user-specified maximum toll amount.
- The toll amount shall remain constant for at least the user-specified minimum tolling interval to avoid driver confusion.
- The toll amount shall be recalculated at every minimum tolling interval. It is possible that the recalculation will result in the same toll amount in the next tolling interval.
- The toll amount shall not change by more than the user-specified maximum change increment from any one tolling interval to the next.
- The toll shall be sufficient to ensure that the Express Lane maintains a user-specified level of service (the maximum toll amount is in effect and maximum change increment constraints may supersede over the level-of-service constraint). Meeting this constraint may require “reserving” some capacity in the upstream segments by posting a higher toll for trips that include those segments than would otherwise be posted. Proposals should specifically address the bidder’s approach to meeting this constraint.
- The system will detect unstable or inappropriate toll amount calculations (e.g., due to unusual circumstances or equipment failure) and fall back to a table-driven toll schedule.

The user-specified constraint parameters shall be set initially during the ETS design task of the project, but the system shall provide the ability for the JPA ED, or his/her designee, to modify them at any time in the future. All user-specified settings for the calculation shall be adjustable by authorized, non-technical persons.

The initial implementation will be for a trip-based toll, but the system must also provide the ability to implement segment-based tolling with the above-listed constraints applied to each segment.

The toll-calculation portion of the TDC must be implemented as a separate module with a clearly- and completely-documented API that describes all interactions with other parts of the TDC with sufficient specificity that the toll-calculation module can be replaced in the future by another contractor.

The dynamic pricing method and calculation shall be formulated by the Systems Integrator during the ETS design phase of the project using the algorithm parameters incorporated into the ETS RFP as a guideline.

During Detailed Design Review, the Systems Integrator will produce a working model of the dynamic pricing calculation engine that demonstrates the capability of the chosen algorithms to set tolls in accordance with the above-stated objective function and constraints. The working model will simulate the toll-setting process by accepting simulation data where each record represents one 15-second time increment and will contain speeds and traffic-counts for each of 15 VDSs and 20 RTMSs. The working model will output toll amounts for each trip type for five-minute increments. The working model need not operate in real time (it may run much faster) and need not be implemented in the same programming language, hardware, or operating system as the operational ETS.

A separate application, provided by the JPA, will generate the simulation data based on reasonable traffic patterns and distributions of values of time. Because the application that generates the simulation data will assign a value of time to each simulated vehicle and will count that vehicle in either the Express Lane or a General Purpose Lane in response to the previously-set toll, it will be possible to evaluate the extent to which the working model achieves revenue maximization given the constraints and the fact that the working model, like the operational ETS, will not know the distribution of values of time of approaching vehicles. It is expected that the chosen algorithms will use data from prior tolling intervals to estimate the distribution of values of time in approaching vehicles, and that the performance of the working model will improve as it runs.

Proposals shall include descriptions and justifications of the bidder's intended toll-setting methods and will address each of the following:

1. How and how often will the system update its assumptions about the distribution of values of time in approaching vehicles?
2. How will data which is collected during the operation of the system be used?
3. Will the process be fully automated?
4. How will initial "seed" parameters to the toll-calculation equations be developed?
5. What data will be stored for the purpose of performance auditing and how long will it be kept?
6. What variables will influence the toll amount? (It is expected that the calculated tolls will take into account at least: upstream traffic conditions, traffic conditions in the various segments of the Express Lane, traffic conditions in parallel GP lanes, traffic conditions downstream, time of day, and weekday/weekend/holiday.)
7. How many upstream traffic sensors will be used and how far upstream should they be located?
8. How will unusual circumstances (e.g., incidents, construction) in the Express Lane or in the GP lanes be handled?
9. How will instability or inappropriateness (e.g., from unusual circumstances or equipment failure) of the calculated tolls be detected?
10. How robust are the toll-calculation algorithms to unusual circumstances?
11. How will tolls be set when the toll-calculation algorithms aren't working properly?
12. In addition to the user-specified parameters described above, what other parameters will the JPA have control over and how will they set them?

The Systems Integrator shall provide, at a minimum, the following:

- A dynamic, real-time, parameter-driven toll rate calculation program that successfully meters Express Lane traffic demand and ensures that the I-680 Express Lane maintains a LOS C/D;
- A toll rate calculation that accounts for traffic densities in the Express Lane and vehicle travel times in the GP lanes;

- A toll rate calculation program that accounts for disparities in traffic densities occurring simultaneously throughout the entire length of the I-680 Express Lane corridor;
- An interval of change for the toll rate (i.e. possibly every 5 minutes) that successfully controls Express Lane demand without creating driver confusion by changing too frequently;
- An individual operator adjustable toll rate increment of \$d.cc that successfully controls Express Lane demand;
- A user settable minimum toll rate of \$1.00; and
- A dynamic pricing structure that provides the ability to toll by segment.

6.4.1.2 Express Lane Trip Assembly

The TDC shall be responsible for gathering and compiling vehicle, transponder, and toll rate data from all tolling zone lane controllers and creating individual trip revenue transaction records that shall eventually be sent to BATA for processing.

When a FasTrak[®] transponder enters the I-680 Express Lane and passes through a tolling zone, the transponder is detected by the antenna/reader and the lane controller verifies that the transponder is valid by comparing the transponder number to the tag status file that is resident in the lane controller's memory. Data, including the transponder number, date, time, tolling zone location of the transponder read, and the toll rate that was in effect when that vehicle entered the Express Lane shall be sent to the TDC. This series of events occurs every time a vehicle that is equipped with a FasTrak[®] transponder passes through an Express Lane tolling zone. Therefore, if it is a through-trip, each time the vehicle traverses a tolling zone a distinct transaction record shall be generated.

If a transponder is detected and it is determined to be valid, the lane controller shall send a command to illuminate the tolling zone beacon. The beacon shall illuminate within 0.1 seconds from the time in which the lane controller makes this determination. For each valid transponder read a transaction record shall be developed by the lane controller and sent to the TDC for future use.

The TDC computer shall then compile each of the vehicle transaction records and event data collected throughout the specific vehicle trip and determine where the trip began, which segments were traveled, when the trip ended, and which toll should be charged.

The TDC shall then determine whether or not there is a more recent Express Lane tolling zone transaction than the most recently received record by comparing the record times to indicate that the specific trip is now complete.

Based upon these internal calculations, the TDC shall then develop an Express Lane trip record, store this record in the proper location and send the trip record to the BATA RCSC for posting to the FasTrak® customer account and to collect the revenue associated with that Express Lane trip. The TDC shall be designed to store Express Lane trip records for at least 12 months.

The ETS shall include parameters that define the maximum duration for a single trip and logic that accounts for events such as a change in direction of travel or a communications failure with one or more tolling zone lane controllers.

The Express Lane system shall be configured to charge one toll per trip, for example the toll rate that is displayed on the DMS as the vehicle enters the Express Lane, but the ETS shall also include functionality that allows for segment-based tolling.

6.4.1.2.1 Toll Rate Safeguards

When a vehicle enters the I-680 Express Lane, the toll rate might change between the time at which the driver views the toll rate on the DMS and the time at which the driver passes through the tolling zone. Based upon near real-time traffic density and speed data, the TDC shall calculate the amount of time it takes for a vehicle to view the toll rate and then pass through the tolling zone that is immediately downstream from the DMS that conveyed the toll rate to that vehicle operator. If the toll rate changes during that interval of time, the driver shall be charged the lesser of the two rates.

The TDC shall also include logic that accounts for DMS communication failures that result in the display of incorrect toll rates.

6.4.1.3 I-680 Express Lane Trip Reconciliation

The TDC shall include Express Lane trip audit and reconciliation functionality. It shall provide a secure user interface which will allow TDC personnel to view and reconcile Express Lane trips and revenue data. The interface shall also include reporting capabilities that allow users to create, execute, and store reports.

The interface shall provide detailed transaction data such as tag-read times and locations, toll rate data, and other supporting raw transaction information. This information shall then be used to verify that trips were properly created and can be reconciled.

The interface shall allow authorized users to make adjustments to the data and correct errors in compiled revenue bearing trips. Users shall be able to adjust individual transactions or bulk sets of transactions if it is determined that an Express Lane trip needs to be developed and/or modified.

The TDC database shall store configurable audit parameters, and provide a permanent audit record, or trail, of any adjustments that are made to summary or detail information.

6.4.1.4 Tolling Zone Operation Monitoring

The TDC shall include a secure, web-based monitoring interface that shall allow authorized users to view raw and summarized transaction and event data, as it occurs in real-time, at each tolling zone.

The tolling zone controllers shall broadcast data in near real-time to the TDC and this data shall be compiled and displayed in an easily understood, graphical manner.

Presented below is typical example data:

- Last 10 transponder reads;
- Transponder and/or traffic volume during the last 15 minutes, last 30 minutes, last hour, since 6:00 a.m., etc;
- Discrete messages and events from the roadside equipment, including
 1. Transponder Identification (ID);
 2. Transponder read time;
 3. Transponder handshakes (the number of times during vehicle passage through a tolling zone that the transponder and the antenna communicate with one another);
 4. Vehicle speed;
 5. Traffic density on a particular segment;
 6. Travel time data in the MF lanes;
 7. Roadside equipment events;
 8. VDS equipment events;
 9. DMS events; etc.

The interface shall support JPA defined user roles, which includes providing different sets of data to different user categories. The interface is intended for use by CSRs, operations staff and maintenance personnel.

The interface shall protect customer information and operate under the requirements of California State privacy legislation.

6.4.1.5 TDC Reporting

The TDC shall provide a fully integrated reporting module to support trip generation and reconciliation, Express Lane operations, BATA record posting and reconciliation and JPA managerial system monitoring requirements.

The module shall include predefined traffic, revenue and CSR audit reports as well as support for ad hoc reporting needs.

The reporting system shall allow users to browse, choose, and run reports through a clearly displayed and user-friendly Graphical User Interface (GUI).

The reporting interface shall allow users to schedule reports to be run in the future.

The reporting interface shall allow reports to be output, saved, or printed in at least the following formats:

1. On-screen;
2. PDF;
3. HTML; and
4. Excel.

When accessing or running reports, the execute-to-display or execute-to-print time shall be less than one minute for each request.

The TDC report server shall be operational and available 24 hours per day, seven days a week.

Presented below is a list, at a minimum, of the required sample TDC reports:

- Express Lane Revenue Report;
- Express Lane Traffic Report (by segment and entire facility);
- Express Lane Trip Posting (to BATA) Report;
- BATA Express Lane Trip Reconciliation Report;
- Transaction and Trip Adjustment Report;
- Tolling Zone History Report;
- Detailed FasTrak[®] Transaction Report;
- CSR Audit Report;
- Toll Rate Change Tables by Tolling Zone;
- I-680 Express Lane Travel Time Report (be segment and by facility);
- GP Lane Travel Time Report (by segment and by facility);
- Equipment Maintenance Reports; etc.

6.4.1.6 Data Transmission

Data transmissions originating from the TDC shall occur automatically and utilize guaranteed delivery protocol.

Data communication between the TDC and the I-680 Express Lane website shall be via an Ethernet connection.

Data communication between the TDC and the BATA RCSC shall be via FTP for Express Lane trip records to and from a pre-configured drop box.

6.4.1.7 TDC Security

The TDC shall securely maintain Express Lane data through a standard login and password-based security system.

Secure user accounts shall be administered through a system administration interface.

The system shall operate under the provisions of all California State privacy laws. For example, customer data that is output for uses other than internal Express Lane operations shall be masked to maintain customer privacy.

The database shall use security service enterprise authentication for connections to the database. This will centralize database security in one location.

All users shall have their own user name and password that is the same across all databases.

Users shall have individual resource usage limits set for them to prevent unauthorized or excessive utilization of system resources.

Profiles shall be used to define resource usage limits by work activity or job type.

Users shall be granted profiles according to their job needs.

The database shall be able to restrict data access down to the row level.

6.4.1.8 Receipt and Downloading of Tag Status Files

The TDC will receive, at least once per day, updated tag status files from the BATA RCSC.

The file acquisition process shall adhere to the BATA Interface Control Document (ICD), a copy of which shall be presented in the appendices of the RFP.

The TDC shall automatically, upon receipt of tag status data from BATA and integrating the files into the TDC database, download either the full or an incremental tag file to each of the three tolling zone lane controllers. The incremental tag status file download would include any new FasTrak[®] accounts or changes to existing accounts.

The method of file download shall be according to the BATA RCSC ICD.

6.4.1.9 Mobile Enforcement Equipment Data Transmission

The TDC shall send tag status data to wireless on-board mobile enforcement equipment terminals to enable the CHP officers to enforce the Express Lane.

This secure data communications application shall be hosted on a wireless network to enable enforcement vehicles to obtain the tag status file data in a real-time basis.

6.4.2 System Data and Software Backups

All TDC data shall be properly backed up to ensure a continuous operation and virtually no loss of data or accounting information.

Activity logs shall be saved weekly on tape backup for three (3) months.

Daily partial and weekly full backups of all data shall be conducted and properly logged.

Transaction logs and records shall be retained for five years.

6.5 REGIONAL CUSTOMER SERVICE CENTER INTEGRATION

6.5.1 BATA ICD

The Systems Integrator shall design and develop the TDC and its functions in accordance with any applicable requirements identified in the BATA Interface Control Document (ICD). A copy of the most current ICD is presented in the Appendix X. The Systems Integrator shall be responsible to maintain the proper TDC/BATA RCSC interface to ensure that the TDC is properly interfaced to the RCSC when any ICD updates are implemented throughout the I-680 Express Lane ETS Contract.

6.6 SYSTEM INTEGRATION REQUIREMENTS

6.6.1 System to System Interfaces

The TDC shall be required to interface with three other systems to obtain data required for I-680 Express Lane toll collection and operations.

The BATA RCSC shall be the single point in which Express Lane toll trips shall be transferred for posting, which shall include debiting the toll charge from the FasTrak[®] customer accounts. The TDC shall also receive tag status files from the RCSC on, at a minimum, a daily basis, reconciliation files and transaction files.

The TDC shall provide the Caltrans TMC with traffic density and speed data from the Express Lane and travel time data from the MF lanes.

The incident detection process shall be the responsibility of Caltrans. In the event that an incident does occur that would require temporary suspension of the ETS and/or Express Lane closure, this shall be accomplished via a command issued by the TMC Manager to the DMSs.

As part of the I-680 Express Lane enforcement effort, the TDC shall also interface to the enforcement equipment that is provided to the CHP.

The TDC shall download the full CTOC tag status file at least once per day to the lane controllers, the MERs and the hand held enforcement devices. Incremental tag status file updates shall also be automatically sent from the TDC to the lane controllers and the enforcement equipment when they are received from the RCSC.

There will be incidents on southbound I-680 that may necessitate the closing of the Express Lane or the diversion of MF traffic to the Express Lane. These actions should only be taken by the CHP, authorized Caltrans TMC staff, with input from the JPA ED.

The TMC shall be included in the system network in order to facilitate emergency actions in the Express Lane.

All actions taken by TMC personnel shall be logged into the Express Lane TDC system database and reports generated that detail those actions.

6.6.2 Equipment Interfaces

6.6.2.1 Lane Controller

The TDC shall interface to each tolling zone lane controller via a real-time Ethernet connection.

The interface will support the transmission of raw vehicle, transponder, and event data. It will also support the transmission of daily incremental transponder status files and periodic toll rate data.

The interface shall be automatic and not require human intervention.

The interface control document will be developed by the vendor during the system design phase of the project.

6.6.2.2 Dynamic Message Sign Rate Display

The TDC shall interface with each DMS via a real-time data and communications connection.

The interface shall support the transmission of message data as well as system status requests and be NTCIP compliant.

The DMS Interface Control Document (ICD) shall be supplied by the vendor that is selected by the I-680 Express Lane Systems Integrator.

6.7 COMMUNICATIONS NETWORK

Presented in the Appendix of this RFP is a copy of the I-680 Express Lane Communications Plan, which is for informational purposes only. Bidders should carefully review this Plan and assess the communications network information provided therein and determine whether their communications network design should be configured in a similar manner. It will, however, be the responsibility of the Systems Integrator to design, develop, test, implement and maintain a communications network that best supports Express Lane operations.

6.7.1 Tolling Zone to Tolling Zone

Tolling Zone to Tolling Zone communication shall be used to provide a redundant or backup communications path to the Tolling Data Center should the primary communications path fail.

- Between the South and Central Tolling Zones this communication path shall be provided by a point to point WiMAX wireless link; and
- Between the Central and North Tolling Zones the redundant communications path shall utilize fixed wireless.

6.7.2 Tolling Zone to TDC

Due to the distances between the Tolling Zones and the TDC and the relatively high costs associated with adding new underground infrastructure, the communication links between the Tolling Zones and the TDC shall utilize either leased data communication services or a wireless communication network solution.

These communication links shall provide a minimum 1.5Mbps data rate and shall have a high level of availability (99.999%).

6.7.3 TDC to RCSC

The network communication between the TDC and BATA RCSC shall utilize leased data communication services and shall be based upon availability of existing communications infrastructure, cost of implementation and performance requirements. The physical link between the TDC and RCSC shall be through frame relay technology.

Data communication between the TDC and the BATA RCSC shall be via FTP for Express Lane trip records to and from a pre-configured drop box.

6.7.4 TDC to Caltrans Traffic Management Center

The network communication between the TDC and the Caltrans TMC shall utilize leased data communication services and shall be based upon availability of existing communications infrastructure, cost of implementation and performance requirements. The physical link between the TDC and RCSC shall be through frame relay technology.

6.7.5 TDC to System Enforcement Equipment

Communications between the TDC and enforcement devices, including the MERs, the hand-held devices and the PDAs, shall utilize a secure, high-speed data connection to the PDA over a cellular data network.

- The cellular data communications network shall provide uninterrupted coverage over the entire length of the project.

- The cellular data communications network shall provide a minimum data rate of 128kbps.
- The communication link between the enforcement device and the TDC shall utilize Virtual Private Network (VPN) tunneling to establish a secure and encrypted connection.

6.8 JPA WEBSITE DEVELOPMENT

The SI shall design, develop, implement, operate, maintain and frequently update a website on behalf of the JPA and the BATA FasTrak[®] program. The primary purpose of the website shall be to provide I-680 Express Lane information to the public. The website shall be secure and shall be maintained with up-to-date and current security technology at all times. The TDC website shall provide, at a minimum, the following facilities to the public, accountholders and potential accountholders:

- General Information on the I-680 Express Lane configuration and operation;
- Check an existing FasTrak[®] account by asking questions of the CSR for the following types of information:
 - Account status
 - Account balance
 - Recent I-680 Express Lane trips
 - Toll rates for recent trips
- Provide Information
 - RCSC location and hours of operation
 - List of tolling zones
 - I-680 Express Lane description
 - FasTrak[®] brochure
 - Frequently Asked Questions (FAQs)
- Link to the Alameda County CMA website
- Link to the CHP
- Link to the 511.org FasTrak[®] website
- Links to road, travel, weather conditions and the Caltrans TMC
- Download I-680 Express Lane marketing materials and terms and conditions
- Web links to related transportation sites

The SI shall maintain access to trained staff for the timely response to requests for changes to the information presented on the website made by the JPA.

The SI shall provide a Spanish language version of the website in addition to the English version. The SI shall be responsible for translating and keeping current all Spanish version materials so

that they are available on the Spanish version of the website. Support of any additional foreign language documents or languages, if required would be handled as extra work.

The JPA shall have the option to request sets of changes to the static content (rate changes, re-branding, changes in operational information, including phone numbers, operational hours, tolling zone locations, etc.) on the website up to six (6) times per year at no additional cost to the JPA. Other changes shall be handled as extra work.

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7. PROJECT MILESTONES

This part of the RFP provides an overall summary of the I-680 Express Lane ETS project phasing, scheduling, and testing requirements.

7.1 PROJECT PHASES

The development program under this contract shall be divided into four (4) overall phases, generally delineated by successful completion of major test milestones. These phases include:

Phase I – Design, Manufacturing, and Factory Test – This phase includes the design, development, fabrication and pretest of components of the entire ETS up to and including successful conduct of a full and detailed Factory Acceptance Test (FAT) of all equipment, software and subsystems in accordance with a pre-approved test plan, which shall be developed by the SI. This test shall be performed by the SI under the supervision of the JPA ED and the Systems Manager;

Phase II - Installation, Testing, and Approval - Field equipment and software installation, including on-site SI testing and debugging, conduct of a detailed Field Acceptance Test and approval for use of the ETS with all components and interfaces fully integrated for Express Lane operation;

Phase III – System Performance Evaluation - Performance evaluation period of three (3) months under actual I-680 Express Lane operation during which time any outstanding problems shall be immediately corrected by the SI. This phase also includes full ETS support, maintenance and operations by the SI, culminating in Final System Approval; and

Phase IV - Warranty Period - Provision of full ETS maintenance, operations and system support during a Warranty Period that shall extend nine (9) months after issuance of Final System Approval. During this phase the SI shall correct any outstanding problems and transfer the maintenance program and the Express Lane operations over to others if the maintenance and operations options are not selected by the JPA. Successful completion of Phase IV shall culminate in Final System Acceptance, which effectively closes the SI Contract.

Presented below in Table 3 are the contractual completion deadlines that are required for each major phase of the work program:

Table 3 - Project Phases

PROJECT PHASE	COMPLETION DEADLINE MONTHS FROM NOTICE TO PROCEED
Phase I – Design, Manufacturing, and Factory Test	10
Phase II – Installation, Testing, and Approval	15
Phase III – System Performance Evaluation	18
Phase IV – Warranty Period	27

The ETS shall be ready for full use and revenue service not later than the time of Express Lane commissioning, which is scheduled for not later than July 20, 2010. If ETS equipment and/or software problems are detected during the system performance evaluation period, and the equipment and/or software is not operating at an acceptable level of performance as defined in this Contract, the SI shall be notified in writing. All problems or defects shall be promptly resolved by the SI. Final System Approval shall not be granted by the Engineer until the ETS performs satisfactorily. It is also noted that within each overall Project phase there are several interim deliverable deadlines, as outlined in this document.

7.2 PROJECT SCHEDULE

The SI shall begin work on the date specified in the Notice-to-Proceed (NTP). The NTP will be issued by the JPA no later than 30 days subsequent to execution of the Contract.

Within 15 days after NTP and prior to the project kick-off meeting, the SI shall prepare and submit a detailed Project Schedule, using MS project, outlining the order in which they propose that all of the work shall be performed. The specific milestone completion dates and installation deadlines set forth in this Contract shall be clearly identified in the Project Schedule. The schedule shall be used as a basis for progress tracking throughout the course of all work on this Contract.

If a delay in the Project Schedule arises due to circumstances beyond the SI's control, the SI shall submit a revised Project Schedule within 10 working days after it is requested by the Systems Manager. Any failure or delinquency in submission of the schedule shall be treated as default on the part of the SI who will then become liable for all possible actions which can be taken, including withholding of any payments due on the Contract.

7.3 WORK PROGRESS

The SI shall use all practical means to make the progress of the work conform fully to the Project Schedule. If the SI fails to meet the dates that are presented in the Project Schedule, the Systems Manager may require him to take any or all of the following actions, at no additional cost to the JPA:

- § Perform overtime work;
- § Increase the number of personnel assigned to the project; and
- § Increase plant or machine capacity.

The SI shall prepare and submit to the Systems Manager monthly progress reports on the status of all major project items and activities. The monthly progress reports shall include an updated Project Schedule, if it is indeed revised during that reporting period.

Project progress meetings shall be conducted monthly at the offices of the JPA, at a schedule to be proposed by the SI and approved by the JPA ED and the Systems Manager. The purpose of these meetings will be to monitor progress, discuss design issues, plan for system installation, prepare for and conduct testing activities, start up of operations, etc.

7.4 PHASE I – DESIGN, MANUFACTURING, AND FACTORY TEST

Upon submittal of the SI's Project Schedule, a kick-off meeting shall be held within 30 days of receipt of NTP by the JPA. At the kick-off meeting all appropriate lines of communication for both oral and written correspondence shall be established. Appropriate methods for documenting meetings, telephone conversations and other communications shall also be defined. The SI's Project Schedule shall be reviewed in detail and refined, as might be necessary. The Systems Manager shall submit, in writing, to the SI any required modification to the Project Schedule.

Table 2, which is presented below, presents the submittal date, based upon number of days from NTP, for all of the documentation that is required under this Contract.

A plan for civil works, including a detailed description of any required tolling zone and/or TDC modifications, and all conduit requirements shall be submitted to the Systems Manager within the time period specified in Table 3.

Work during this phase shall include all ETS design, software development, hardware procurement and/or fabrication, shop testing, software testing, integration testing, software documentation and overall ETS design documentation culminating in a full and complete FAT. Periodically throughout this phase, the Systems Manager may visit the SI's development facility in order to inspect work in progress and might, from time-to-time, request reasonable demonstrations of ETS equipment, software, interfaces and subsystem operations. The Systems Manager will give reasonable advance notice to the SI prior to any factory visits. At such time that the SI has completed all development, fabrication and integration of the ETS, including detailed internal testing, the SI shall provide written notice to the Systems Manager requesting the scheduling of a full and complete FAT. The SI shall provide test scripts for the review and approval of the Systems Manager no later than 60 days prior to the scheduled date of the FAT.

Table 4	
DOCUMENTATION SUBMITTAL SCHEDULE	
DOCUMENT SUBMITTAL	DUE DATE
Progress Schedule (re-submittal within 10 days if requested)	30 Days from NTP
Project Management Plan	30 Days from NTP
Conduit Plan Review and Comments	60 Days from NTP
Preliminary Test Plan	60 Days from NTP
Software Development Plan	60 Days from NTP
Factory Acceptance Test Plan	120 Days from NTP
Field Test Plan	180 Days from NTP
Sepias and Shop Drawing Documents	90 Days from NTP
Sample of all On-Demand and Automatically Generated Reports	90 Days from NTP
Preliminary Installation Plan	90 Days from NTP
Quality Assurance Plan	90 Days from NTP
Software Specification	90 Days from NTP
Detailed Design Document	150 Days from NTP
Final Installation Plan	180 Days from NTP
Wiring Diagrams	180 Days from NTP
Training Plan	270 Days from NTP
Maintenance Plan	300 Days from NTP
Preliminary Draft Software Documentation	30 Days after Phase I Approval
Preventive Maintenance Schedule	60 Days after Phase I Approval
Maintenance Personnel/Spare Parts List	60 Days after Phase I Approval
Preliminary Maintenance Service Manual	Prior to Commencing Equipment Installation (Phase II)
Parts List	30 Days after Phase II Approval
Final Draft Software Documentation	Upon Issuance of Phase II Approval
Schedule of Preventive Maintenance	60 Days after Phase II Approval
TDC Operator Manual (Final)	60 Days prior to Installation of Central System
Auditor's Workstation Manual	30 Days before Collector Training
Customer Service Representative Manual (Final)	30 Days before Collector/Supervisor Training
Final Software Documentation	30 Days after Issuance of Phase III Approval
Final As-Build Drawings	30 Days before Phase III Approval
Maintenance Service Manual (Final)	90 Days before Phase IV Approval

The SI shall provide written results and evidence of his own testing prior to the FAT. If the proposed test scripts have been approved and, if after reviewing evidence of satisfactory SI internal testing of the ETS and all of its interfaces, the Systems Manager will send a letter to the SI indicating that they are allowed to proceed with the FAT.

The FAT shall involve testing of all subsystems to be installed as part of the Express Lane ETS. All components shall be fully fabricated and integrated and ready for installation at the time of the FAT. At least one complete subsystem of each category shall be installed at the SI's site for the purpose of this FAT, including:

- § One tolling zone subsystem, including the lane controller, a complete FasTrak[®] subsystem (reader, antenna and transponders), a tolling zone beacon, a loop VDS, an RTMS VDS, a DMS, plus all necessary communication equipment;
- § A CCTV subsystem, including all necessary communications equipment;
- § Enforcement subsystem, including use of the tolling zone beacon, the hand-held device and a MER, plus all necessary communication equipment;
- § The TDC subsystem with a fully configured computer system including all software, printers, dynamic pricing algorithm subsystem, the Express Lane website, the CSR workstation operations, and any necessary communication equipment; and
- § All of the TDC interfaces, including with the tolling zone subsystems (2-way), the other roadside equipment, the BATA RCSC (both ways), the Caltrans TMC, and the enforcement subsystem.

Any ETS functions defined in this Contract, as well as any Contract amendments, shall be subject to detailed testing and verification by the Engineer during the FAT. If, in the judgment of the Engineer, the FAT indicates that the ETS equipment and software appear to be functioning satisfactorily in accordance with a predefined test plan and all functional and technical requirements of the Contract, the Systems Manager shall issue written approval of the FAT and authorize shipment of equipment to the site for field installation.

This Approval of the FAT shall in no way reduce or eliminate the SI's full responsibility to resolve any problems and make the ETS operate in full conformance with the requirements of this Contract. Nor shall it limit the rights of the JPA or the Systems Manager, to bring ETS related problems to the attention of the SI at a later time.

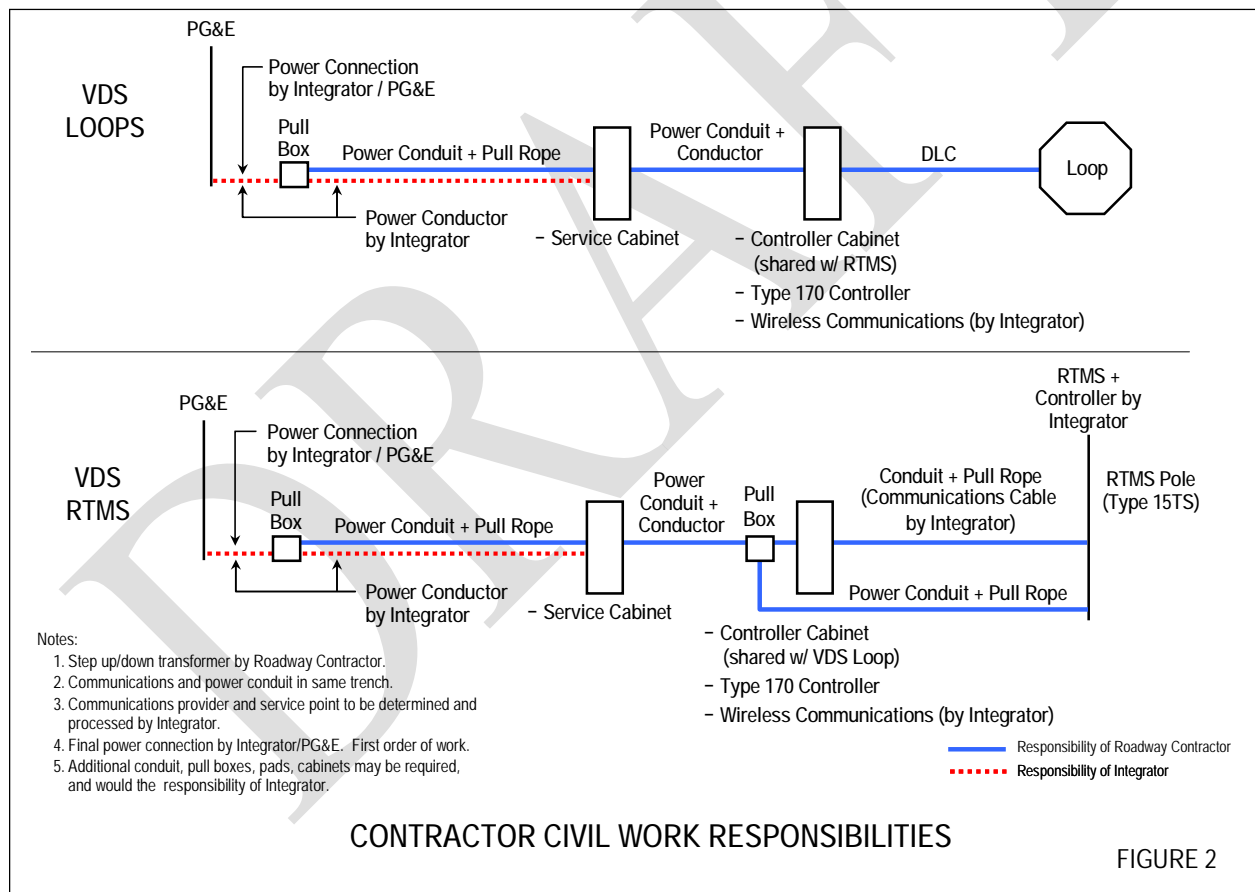
7.5 PHASE II – INSTALLATION, TESTING, AND APPROVAL

With the issuance of FAT approval by the Systems Manager, the SI may be authorized to immediately commence shipment of the ETS equipment to the site to begin the installation phase. No actual equipment installation activity shall take place on site until FAT approval has been obtained. However, if any conduit installation or other minor physical modifications at the

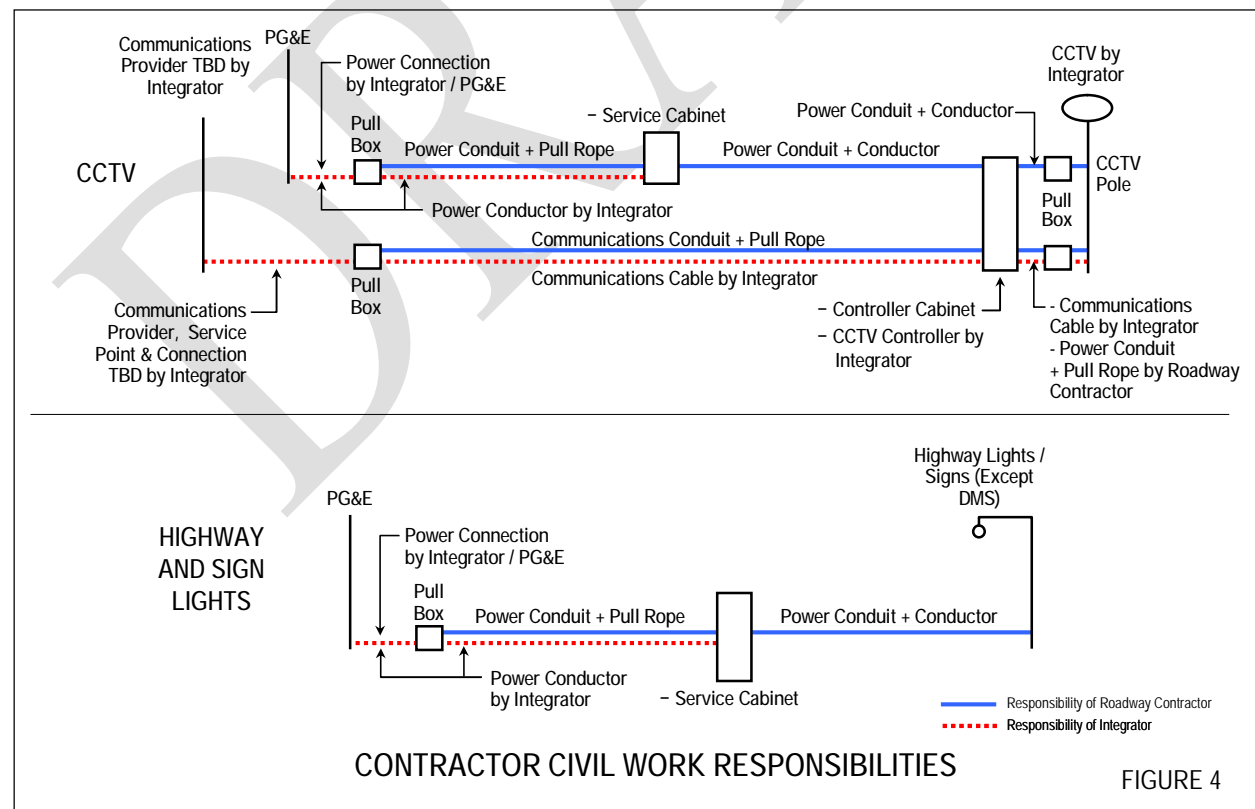
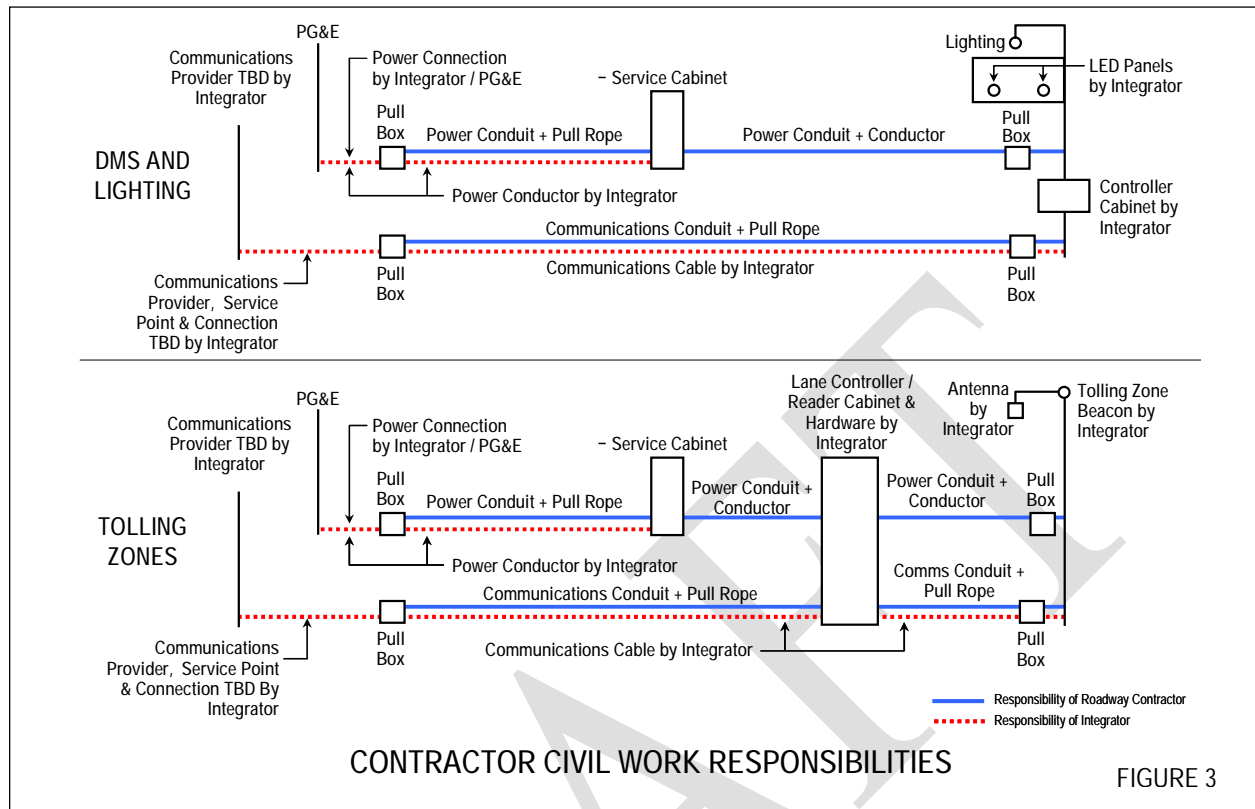
tolling zone sites are required, these may be performed prior to approval of the FAT. Any pre-FAT approval installation activity shall be approved, in writing, by the Systems Manager.

The installation and site testing shall begin at the tolling zone that is identified in the Installation Plan and when successfully completed, installation may begin at the other tolling zone sites. The SI may present a proposal to partially overlap installation at the tolling zone sites for the consideration and approval of the Systems Manager. If an overlap in installation is proposed, it shall be clearly identified in the Project Schedule.

The SI and Roadway Contractors shall have various responsibilities pertaining to the installation activities. Presented in Figures 2, 3 and 4 are the power and communications conduit, cabling, and equipment installation responsibilities for the SI and the Roadway Contractors. The SI shall be required as an early action item to carefully review the Roadway Contractor's power and communications conduit, conductor and ETS equipment installation drawings and develop a joint plan of action that will allow the parties to work in close coordination with one another.



Plans for civil works shall be submitted to the Systems Manager for review and approval. Actual installation will be inspected by, and subject to the approval of the JPA's designated representative. Installation of the ETS equipment shall be performed by trained personnel who are familiar with all aspects of the equipment. During the installation phase of the project, the SI



shall provide a Resident Installation Manager conveniently located and accessible to the Systems Manager from a local office. During phases other than the installation phases, the SI's Project Manager shall be readily accessible via telephone and/or pager. In addition, the SI's Project Manager shall report to the site within 24 hour notification from the JPA or the Systems Manager.

In the event that any structure is damaged due to the SI's activities, such damage shall be repaired immediately at the SI's expense and to the satisfaction of the JPA and the Systems Manager.

The SI shall make his own arrangement for power, water and waste at the work site.

The SI, under the supervision of the Systems Manager, shall perform the Field Acceptance Test. This testing shall include individual lane equipment, subsystem testing, testing of the dynamic pricing algorithm, TDC testing, communication networks and any other reasonable test that may be required to verify proper functioning of the ETS.

Phase II field testing shall include full end-to-end simulated system load testing. Software simulators shall be used to generate realistic data at each tolling zone site. The simulated data shall pass through the entire ETS including the communications network and the TDC, and ultimately to simulated account postings at the RCSC, output reports, etc. Testing shall include a minimum of five (5) full days of real time simulated operations.

The conclusion of Phase II shall be signified by the completion of installation and testing of the new ETS, the completion of site verification tests at the three (3) tolling zone sites and at the TDC.

7.6 PHASE III – SYSTEM PERFORMANCE EVALUATION

Phase III will begin after the conclusion of Phase II and with the opening of the southbound I-680 Express Lane to traffic. If the SI is informed that the project is not ready to open to traffic at the completion of Phase II, the SI's work will be suspended until the roadway is ready to open to traffic. During Phase III of this Contract, a three (3) month period of observation and evaluation of the new ETS under actual use shall take place. The SI shall be required to fully support and maintain the ETS, in accordance with provisions set forth in the Maintenance Provisions of this document. Any problems detected during the monitoring of the ETS during Phase III shall be immediately brought to the attention of the SI for resolution. At the conclusion of this evaluation period, if the ETS is considered to be operating fully in compliance with the RFP and the Contract requirements, the Systems Manager will provide the SI with written notice of Final System Approval.

The SI shall also be responsible for TDC operations during Phase III and through the Warranty Period. Starting at the beginning of Phase II and continuing through the end of Phase III, the SI shall provide a full-time manager on-site to advise and assist the JPA in start-up and initial

operation of the ETS. Although it will be necessary for this individual to be knowledgeable in all aspects of the ETS, he/she should be particularly familiar with the TDC operations.

7.7 PHASE IV – WARRANTY PERIOD

The final phase of this Contract, Phase IV, shall include continued ETS maintenance and TDC operations through the 9-month Warranty Period. The Warranty Period shall commence with the granting of Final System Approval to the SI by the Systems Manager.

All provisions, as set forth in this RFP and the other Contract documents, shall be in effect throughout the Warranty Period. During this Period the SI shall supply adequate maintenance and operations personnel, spare parts, factory support and CSR oversight to ensure the ETS remains fully operational in full accordance with system performance requirements and problems are corrected within the repair/replacement times as indicated in the maintenance section of this RFP.

If through and at the conclusion of the 9-month Warranty Period the system is operating in full accordance with the RFP and the Contract documents the Systems Manager shall grant written Final System Acceptance.

The JPA shall advise the SI as to whether or not the Maintenance and Operations Option will be exercised at least 90 days prior to the scheduled completion of Phase IV.

7.8 PROJECT MILESTONES

The following section shall define the project milestones and payment provisions for this contract. Presented in Table 5 below is a chart that shows the major Express Lane Project milestones and the number of calendar days from NTP each of the milestones shall be completed by the SI. The SI shall successfully complete each milestone prior to proceeding with the next milestone activity.

Upon completion of each milestone, the JPA's Systems Manager will issue a letter of certification indicating that the SI has successfully completed the milestone.

Table 5 – Project Milestones	
PROJECT MILESTONE	CALENDAR DAYS FROM NTP
Notice-to-Proceed	0
Detail Design Review	270
Factory Acceptance Test	300
Equipment Installation	390
System Acceptance Test	450
Final System Approval	450
Final System Acceptance	810

7.8.1 Detail Design Review

Successful completion of the Detailed Design Review milestone shall be achieved when the JPA has approved the Detail Design and accompanying documents submitted by the SI.

7.8.2 Factory Acceptance Test

Successful completion of the Factory Acceptance Test milestone shall be achieved when the SI has demonstrated that the I-680 Express Lane System has met all of the functional and performance requirements set forth in this RFP and in accordance with the Factory Acceptance Test Plan and Procedures.

7.8.3 Equipment Installation

Successful completion of the ETS equipment installation, including all of the roadside FasTrak[®] equipment, the TZCs, the VDS devices, communications hardware/software, TDC equipment and devices that are used to interface to external systems (RCSC, Caltrans TMC, system enforcement units, etc.).

7.8.4 System Acceptance Test

Successful completion of the System Acceptance Test milestone shall be achieved when the SI has demonstrated that the installed Express Lane system has met all of the functional and performance requirements set forth in this RFP and in accordance with the System Acceptance Test Procedures.

7.8.5 Operational Test

Successful completion of the Operational Test shall be achieved when the Express Lane system has operated without equipment failure and in accordance with the functional and performance requirements for the last 30 days of the evaluation period without major equipment or functional failure. The Operational Test may be extended to in order to achieve the last 30 days without any major equipment or functional failure.

7.8.6 Final System Acceptance

Final System Acceptance shall be considered achieved when the JPA has certified that the Operational Test has been completed and that all other project documentation and activities required of the SI have been provided.

Issuance of Final System Acceptance shall also indicate the beginning of the nine (9) month warranty period.

7.9 PROJECT PAYMENT PROVISIONS

Payment for services and materials provided by the SI under the terms of this contract shall be made at various intervals based on the milestones achieved above, less any amount assessed by the JPA against the SI due to liquidated damages.

7.9.1 Retainage

Five (5) percent of all payments made pursuant to this Contract shall be retained by the JPA in an escrow account. Payment of the five (5) percent retainage shall be made at the end of the nine (9) month Warranty Period.

7.9.2 Mobilization

Once NTP has been issued to the SI an invoice may be submitted to the JPA for mobilization payment. The mobilization payment shall not exceed more than five (5) percent of the Contract cost.

7.9.3 Detail Design Review

Upon successful completion of the Detail Design Review the SI may invoice the JPA in the amount not to exceed fifteen (15) percent of the Contract cost.

7.9.4 Factory Acceptance Test

Upon successful completion of the Factory Acceptance Test the SI may invoice the JPA in the amount not to exceed twenty five (25) percent of the Contract cost.

7.9.5 System Acceptance Test

Upon successful completion of the System Acceptance Test the SI may invoice the JPA in the amount not to exceed thirty (30) percent of the Contract cost.

7.9.6 Final System Acceptance

Upon successful completion of the System Acceptance Test the SI may invoice the JPA in the amount not to exceed twenty (20) percent of the Contract cost.

7.9.7 Payment for Subsystem Components

Payments for subsystem components in the quantity actually installed shall be made in accordance with this RFP. Except where otherwise indicated, sixty percent (60%) of the unit costs proposed for the item will be paid upon delivery of the item to the job site and receipt of full subsystem documentation after successful completion of the Factory Acceptance Tests. Thirty percent (30%) will be paid at Final System Approval. The remaining ten percent (10%) will be paid at Final System Acceptance.

The five percent (5%) retainage shall be withheld from all payments under each of above described payment categories.

7.9.8 Documentation Payment

Payment for software documentation and user manuals shall be made in accordance with the following schedule:

- § Fifty (50) percent at the time of approval by the JPA, of draft submittals of the software documentation and each of the manuals provided by the Systems Integrator; and
- § Fifty (50) percent upon approval by the JPA of final versions of the software documentation and user manuals provided by the Systems Integrator.

In the case of software documentation, the draft submittal referred to above shall mean the submittal due upon successful completion of Phase II. The cost of all other types of

documentation relating to individual subsystems or components shall be included in the overall cost for each subsystem or component as described in Section 1 of this part.

A five percent (5) retainage shall be withheld from all payments due for documentation and user manuals as defined in this subsection until such time as the JPA grants, in writing, Final System Acceptance.

7.9.9 Training Payment

Payment for training shall be made upon satisfactory completion, as determined by the JPA, of the required courses. Payments for training shall also be subject to a five percent (5%) retainage withheld until Final System Acceptance.

7.9.10 Installation Payment

Payment for installation will be made at the successful completion of the ETS equipment installation phase of the Contract. A five percent (5%) retainage shall be withheld from all payments due for installation until such time as the JPA grants Final System Acceptance.

7.9.11 Project Management Payment

Payment for project management will be made in accordance with the following schedule:

- § Thirty-five percent (35%) at the successful completion of the Factory Acceptance Test;
- § Twenty-five percent (25%) at the successful completion of the ETS equipment installation phase;
- § Twenty percent (20%) at the Final System Approval; and
- § Twenty percent (20%) at the Final System Acceptance.

A five percent (5%) retainage shall be withheld from all payments due for project management until such time as the JPA grants Final System Acceptance.

7.10 QUALITY ASSURANCE

7.10.1 Quality Control Program

The SI shall establish and maintain an effective quality assurance and quality control (QC) program to assure compliance with the requirements of the Contract. The program and procedures used shall be developed by the SI and carefully tailored to meet Contract requirements.

The SI's quality program shall address all aspects of the Express Lane system from design through manufacture, installation, system acceptance, and final acceptance. Software as well as hardware shall be under the control of the SI's quality program.

The SI shall describe its quality program in the technical proposal. At a minimum, the proposal response shall describe the following elements of the SI's quality program as it shall apply to the I-680 Express Lane system.

- § Inspection and Verification Program;
- § Testing Program;
- § Vendor Control Program (sub-contracting);
- § Written Instructions for Control of Work;
- § Calibration of Test and Measuring Equipment;
- § Deficiency Tracking and Corrective Action Program;
- § QA/QC Organization and Personnel Assigned; and
- § Quality Records Maintained.

The SI shall assign to this project an engineer whose sole responsibilities shall be the quality and reliability of the Express Lane system. This engineer shall be in place within 30 days of Contract award and shall remain assigned to the Express Lane system throughout the Contract until final acceptance of the system.

The SI's quality program shall include those internal inspections by an independent inspector or verifications necessary to ensure that the Express Lane system being provided meets the requirements of these specifications and the highest standards of quality.

Inspections and/or verifications shall be used by the SI for all appropriate steps related to this Contract and the Express Lane system. Inspections/verifications shall be appropriate for design, incoming materials, fabrication, in-process inspection, final assembly, unit and system testing, and at any other point in the development process at which quality must be assured.

Inspections or verifications for function or performance shall be accomplished in accordance with written procedures. Such procedures shall define the objectives to be met as well as the step-by-step inspection/verification to be accomplished. Accept/reject criteria shall be included within the written procedures. Inspections or verifications for trade workmanship may or may not require written procedures, as determined by the SI.

When inspections require JPA witnessing, those inspection procedures shall require JPA approval before scheduling the inspection.

Inspections/verifications for function or performance conducted by the SI shall require the generation of records that shall include the legible signature of the SI employee performing the inspection or verification. The JPA shall retain the right to review and audit such records either at the SI's plant or after submission by the SI to the JPA.

System plans, drawings, work procedures, and inspection documents shall identify the inspections or verifications to be carried out. (Conventional QA terminology identifies inspection points as "I" and verification points as "V" on documentation.)

Status records of inspections/verifications shall be maintained by the SI to preclude the issue or use of material, equipment, or components that have not passed inspection/verification successfully. Non-compliant materials or products of any type shall be tagged and separated from acceptable product.

At a minimum, the final assembly inspection (which may be combined with the inspection at source) shall confirm that all applicable prior in-process or assembly inspections/verifications have been successfully completed before performance of the final assembly or source inspection. The SI shall not ship to the site any Express Lane system equipment, components, or software that have not completed all prior inspections or verifications required by this Contract and/or the SI's own QA/QC program.

The SI is advised that the JPA shall require not less than 30 working days for review and comment on inspection or test procedures submitted for approval unless longer periods are indicated within these specifications. The resubmission of inspection or test procedures should be anticipated on documents that generate numerous JPA comments or questions. The 30 working day period shall commence upon receipt of the document at the JPA office (date stamps shall be used).

Inspection and test procedures that require JPA approval shall have a format and content that, at a minimum, generally conform to the following:

- § Test or inspection methodology (step-by-step instructions for conducting the test or inspection);
- § Accept/Reject Criteria;
- § Test or Inspection Report to be provided; and
- § Any special requirements or concerns.

7.11 DESIGN AND IMPLEMENTATION

Presented in the Appendix to this RFP is a copy of the Systems Engineering Management Plan (SEMP) that was developed for the southbound I-680 Express Lane Project. This document includes a description of the various SEMP guidelines that the SI should use during the ETS design, development, integration, testing and implementation phases of this Contract. It is important to note that the SI is fully responsible to develop a series of system design, development, integration, testing and implementation plans as part of this contract and, therefore, the SEMP is being provided for informational purposes only.

7.11.1 Documentation Requirements

The SI shall submit all Documentation and Plans in the English language.

The SI shall submit Documentation and Plans for JPA review and approval in sufficient time for a minimum of two iterations of review. JPA will endeavor to expeditiously review submitted documents but the SI should plan for a minimum JPA review time of ten (10) business days.

Multiple simultaneous submittals may extend JPA's review times. Approval of documents shall not relieve or limit the SI's responsibility to provide systems in full compliance with the Technical Provisions. If corrections or improvements are requested, the SI shall resubmit the Documentation and Plans until such time as it is fully acceptable. Any need for re-submittal shall not be seen as a cause for delay in completing the project in accordance with the schedule requirements.

Deviations from the Technical Provision requirements that may be contained within the SI submitted documents, even though the document may be approved by JPA, shall not have the effect of modifying Contract requirements. Only specific requests to JPA from the SI for waivers or specification change that are formally approved by JPA shall void or change requirements in the Contract.

For the I-680 Express Lane System development portion of the Work the Documentation shall include, at a minimum, the documents listed below:

- Project Management Plan;
- Software Development Plan;
- Software Specifications;
- Configuration Management Plan;
- Preliminary Design Document;
- Detailed Design Document; and
- Various Test Plans.

7.11.1.1 Project Management Plan

The Systems Integrator shall be responsible to prepare a Project Management Plan (PMP), as well as, developing, implementing, maintaining and adhering to the Project management organization and system contained in the PMP. The PMP shall describe the organization, authority, reporting relationships, and procedures to be implemented to manage and control the Work. The Systems Integrator shall provide the personnel, equipment, and tools necessary to plan, design, construct, and perform all Work. The management organization must manage the Work in a manner that ensures safety, quality, and environmental sensitivity.

7.11.1.2 Software Development Plan

A detailed Software Development Plan (SDP) shall be prepared by the SI and submitted to JPA for review and approval. This plan shall indicate all elements of the software development process and shall include, but not be limited to, the following:

- Software Development Schedules;
- Software Development Tools;
- Assignments to Sub-contractors;
- Programming Languages;
- Software Development Quality Control and Quality Assurance;

- Software Testing Plan;
- Software Documentation Plan; and
- Software Management Plan.

A complete program of software testing shall be defined as part of the SDP Plan. The Integrator's testing plan shall include a summary of test procedures, dates and equipment to be used for each particular test. The SDP shall include a description of documentation to be provided for application programs, as well as incorporating standards to be followed and sample documentation, where available.

7.11.1.3 Software Specification

The Systems Integrator shall prepare a detailed Software Specification (SS) that includes a description of all programs and subroutines satisfying all functional requirements, as set forth in the Contract documents. Flow diagrams shall be included in the software specification for programs used in all subsystems to clearly identify data flow through the system and to illustrate the relationship between individual programs and/or subroutines.

A preliminary data dictionary and file/record document shall also be included in the software specification. This document shall define all data messages, records and files accessed by more than one program in the Express Lane System.

7.11.1.4 Configuration Management Plan

The SI shall develop and provide a Configuration Management Plan (CMP) for the review and approval by JPA to be adhered to throughout the duration of this project. A method of configuration management shall be utilized in order to efficiently and accurately track and monitor the progress and changes that occur in all areas of this project.

At a minimum, the CMP shall address the following areas:

- Configuration Control;
 1. Requirements Management.
 2. Deviation and specification change requests.
 3. Data Management.
 4. Configuration Audits;
 - a. Functional.
 - b. Physical.
 5. Approval Requirements for installed systems.
 6. Testing Requirements for installed systems.
- Configuration Status Accounting;
 1. Document Control and the Library Function.
 2. Approved Documents.
 3. Revision History for Documents.
 4. Physical Item Content.

5. Physical Item Where Used.
6. Status of Changes.
7. Changes by Product/Serial Number.
8. Results of Configuration Audits.
9. Configuration Management Accounting (As Designed, As Built, As Delivered).
10. Mod Status of Installed Systems.

7.11.1.5 Back-Up and Disaster Recovery Plan

The SI shall develop and submit a backup and disaster recovery plan for the ETS in accordance with the relevant guidelines of the State of California. The plan submittal and the ETS design shall support the approved plan. During the operations phase of the Contract the SI shall conduct the plan testing described in the above referenced disaster recovery guidelines.

The ETS data storage system shall provide built-in redundancy using a technique such as data mirroring.

A new image copy of the entire ETS shall be created after any application and/or operating system upgrade performed by the SI. The monthly backup shall include all files, data, and software to completely restore the system to an operational state

7.11.1.6 Preliminary Design Documentation

The Preliminary Design Documentation (PDD) shall include detailed information on schedule, organization, technical approach, methodology, risk mitigation and other issues related to a complete plan for software development. The topics for the PDD shall include, but shall not necessarily be limited to, the following:

- Schedule;
- Organization;
- Methodology;
- Overall System Architecture;
- Requirements for each System or Subsystem;
- Project Management Plan, Quality Assurance Plan, Software Development Plan, SI Organization, Schedule Configuration Management Plan;
- Civil Work Plan;
- Examine and Assess Alternatives, where appropriate, for Each Subsystem or Component;
- Assess Design Issues and Associated Risk;
- Risk Mitigation;
- Assess Design Alternatives; and
- Status of environmental testing for system components.

In addition, the Systems Integrator shall address and show compliance with quality assurance, reliability, maintainability, software development and other system requirements. Hardware

concept drawings and preliminary level engineering specifications shall be submitted during this review.

7.11.1.7 Detailed Design Documentation

The Systems Integrator shall provide a functional narrative text, system and subsystem block diagrams, data flow diagrams, data structure diagrams, schematics and any other graphic illustrations to demonstrate the technical adequacy of the system design approach and compliance for system hardware and software with quality assurance, reliability, maintainability, software development, and other requirements of these specifications.

The Detailed Design Documentation (DDD) shall be an extension of the approved PDD document. It shall include such detail as block diagrams, software design, testing procedures, operational procedures, etc. A list of equipment for each function along with a description of its role shall be provided.

The DDD shall be an extension of both the Contract documents and the System Integrator's Proposal. It shall include such detail as block diagrams, screen layouts, report formats, software design, testing procedures, operational procedures, and other pertinent design documentation. A list of equipment for each function along with a description of its role shall be provided. Any equipment listed in the DDD that has not been listed in the Cost Proposal or supplemental cost sheets shall be accompanied by the equipment specifications. Such equipment shall be provided at no increased cost to JPA.

The topics to be discussed in the DDD shall include, at a minimum, the following:

- § Scope of Project;
- § Master Schedule;
- § Compliance Review Matrix;
- § Document Requirements and Explanation, including for:
 - Roadside Equipment and Tolling Zone Design
 - Functionality
 - System Function Flow Chart – Each Tolling Zone Type
 - Hardware, Specifications and Integration
 - VDS Subsystem
 - TDC Host Server
 - Network Communications
 - Maintenance Functionality
 - MOMS
 - MOMS Messages
 - Maintenance Service and User Interface
 - Spare Parts complement to be provided
 - Hardware, Specifications and Integration
 - Network Communications
 - Maintenance Functionality
 - MOMS

- Maintenance Service and User Interface
- Software / Database Design
 - Software Specification
 - Operating System (OS)
 - Programming Language
 - Version Management
- Reports
- Performance Standards
 - Capacities
 - Degraded Modes of Operations
 - Speed
 - System availability calculations
 - Environmental Requirements and Specifications
 - Network Communications
- Environmental Testing Results

7.11.2 Testing Requirements

7.11.2.1 Test Plan

The SI shall prepare a detailed plan for testing all components of the Express Lane system. This plan shall include environmental certification, functional tests, performance tests and all other tests. The Systems Integrator shall submit a written report documenting the results for all tests performed and comparing them to the expected results.

Tentative dates for conducting the various tests shall be included in the test plan, as submitted by the SI. Reasonable modifications to these dates may be permitted during the course of the Work provided a written request for such changes is made at least two (2) weeks prior to the revised test date.

The Test Plan shall define the following:

Environmental Certification - The process for certifying that each item of tolling zone equipment satisfies the environmental requirements is presented above in Section 6.1.3. This is to be accomplished either by providing documentation for tests previously performed or conducting environmental testing to certify the equipment item.

Factory Acceptance Testing (FAT) – The Integrator shall perform factory acceptance tests, which shall include testing of the hardware, software and various subsystems that will be provided by the Integrator. These tests shall be conducted at the Integrator's facility using their test facility. The purpose of the FAT is to internally verify as many of the system requirements prior to the on-site Express Lane System Approval Test as practical. To minimize the risk of later discovery of problems, the FAT tests will, as much as possible, be performed as an integrated

system rather than as independent subsystems, using a representative system slice of the tolling hardware and integrated software that is assembled and connected using the WAN and LAN configured for the actual production system. JPA, and/or its representatives, reserve the right to witness and participate in the Factory Acceptance Testing.

Operational Testing- The Test Plan shall define procedures for evaluating the System in a real world environment. The Operational Testing is to be conducted and evaluated by the Systems Integrator. The Operational Testing Procedures shall include but not limited to the following:

- Review of recorded transaction data to identify any patterns that suggest erratic or faulty system behavior. Such indications may prompt further analysis or investigation.
- Review of MOMS and other maintenance data to identify reliability problems.
- Controlled testing through the insertion of test vehicles into real traffic.

Performance Audit- The Test Plan shall define controlled test procedures for evaluating the System on an annual basis to ensure that system reliability and accuracy have not degraded over time and the Express Lane System continues to satisfy the functional and performance requirements. Procedures should be similar to those defined for Operational Testing. The Systems Integrator shall also incorporate selected JPA ad hoc tests into the Performance Audit test procedures.

Test plans shall include details on the test environment including the hardware, software and test items and dependencies comprising the test environment, and the overall flow of the test activities. The Test Plan shall provide a matrix listing each requirement and how that requirement is to be tested or demonstrated, by inspection, analysis or test. For those requirements that are to be verified through testing, the matrix shall outline the particulars such that the test shall be clearly identified and a description or objective given for each test, including the requirement under test, and the conditions/scenario of the test and the number of test runs planned in addition to the method of verification. Each condition or scenario detailed within test plan shall also include the types of data to be recorded and the acceptance criteria for the test.

Conditions and scenarios should detail individual tests that relate to the capture, generation, contents and transfer of all transaction types individually and in combination and their related requirements. Scenarios should also include tests that require the tolling zone to be able to process a specific rate of transactions and successfully transfer those transactions in both normal operational modes and various degraded modes of operation.

Conditions and scenarios of the tests should include items such as lighting, type of vehicle, and the speed and movement of the vehicles through the Tolling Zone (left to right, straddling lanes, vehicle speed, and mix of vehicles with and without tags). The Express Lane System Approval Testing shall include correlation testing where platoons of closely spaced vehicles, some with and some without tags and the system correctly identifies and captures images of the violators.

This identification of violators shall be accomplished without recourse to the use of license plate numbers of the test vehicles.

7.11.3 Factory Acceptance Test, Procedures and Reporting

The tests to be performed shall be according to internal plans and procedures of the SI and shall be witnessed by the SI's Quality Control Staff. It is the responsibility of the SI to ensure best practices are being utilized to test with perceptiveness and thoroughness. Issues and problems uncovered during Factory Acceptance Testing which result in a design or process change shall be reported to JPA. While intended as an internal test JPA reserves the right to review all plans, procedures and data generated from the Internal Factory Acceptance Test.

7.11.4 I-680 Express Lane System Approval Test

The tests to be performed shall be defined in the Integrator's Express Lane System Acceptance Test Procedures which the Integrator shall prepare and submit to JPA. Prior to Express Lane System Approval Testing all test scripts and scenarios shall be approved by JPA and/or its representatives.

Tentative dates for conducting the various tests shall be included with the Express Lane System Acceptance Test Procedures. Reasonable modifications to these dates without delaying the overall schedule may be permitted by JPA during the course of the Work, provided a written request for such changes is made at least two (2) weeks prior to the revised test date.

If there are any failures or anomalies in conducting any test step, the Systems Integrator shall take the necessary corrective action and the test shall be repeated. In the case that corrective action is undertaken by the SI, he shall perform any necessary regression testing to ensure that such corrective action has not adversely affected the system's ability to pass previously conducted test steps. If necessary this process shall continue until success is achieved.

If an Express Lane System Acceptance Test indicates that the system and its components are satisfactory, JPA will issue written approval of the Acceptance Test for the configuration. If the results are not satisfactory, according to the JPA and their representatives, the SI shall request the scheduling of a subsequent test re-run to occur after corrective action is completed.

Components used in the Express Lane System test shall be production models, which would be suitable for installation at Tolling Zones.

The Express Lane System test shall be performed by the SI under the supervision of, and with the participation of JPA. JPA shall be permitted to conduct ad hoc testing that it deems appropriate after or during the formal tests. Any observed repeatable deficiencies shall be brought to the attention of Systems Integrator and these shall be incorporated in the test review and evaluation.

If the Express Lane System includes several Tolling Zones with identical road configurations, the Integrator may conduct the Express Lane System Approval Test on one of the identical Tolling Zones and conduct an Approval Test on the remainder.

7.11.5 I-680 Express Lane System Approval Test Procedures

The Systems Integrator shall prepare detailed Acceptance Test Procedures or scripts for the I-680 Express Lane System Approval Test. The Test Procedures shall cover test set-up, step by step procedures for controlled tests and the expected results for each step. Tests shall be “end-to-end” so that results are tracked through the system, whenever possible. For example, the impact of parameters set by and communicated from the JPA TDC to outside systems shall be closely observed in the behavior of the lane systems or results of tests that are conducted in the lanes at the tolling zones are tracked at the TDC. JPA will arrange for reports of the transmitted test transactions and video images to be processed by the central computer and provided to the Integrator.

The following are illustrative of the aspects of the Express Lane ETS that are, at a minimum, to be demonstrated during conduct of the tests:

- Power up tests;
- Verify initialization;
- Verify data integrity (no loss of data);
- Verify diagnostic messages;
- Introduce failures;
- Verify diagnostic messages;
- MOMS Reporting;
- Normal FasTrak[®] Transaction Tests;
- Lane operational tests;
- Functioning of the TDC and interface to the TZCs, the RCSC, the Caltrans TMC, etc.;
- System enforcement processing;
- Various vehicles speeds from 5mph to 100mph;
- Varying light conditions;
 - Various speeds;
 - Correct identification of violators within a platoon of vehicles;
- Proper association of vehicle and transponder;
 - Platoons of closely spaced vehicles with a mix of tagged and untagged vehicles and vehicles of various types;
- ETC transaction tests; and
- Tolling Zone stand-alone operation tests.

7.11.6 I-680 Express Lane System Approval Test Report

Within 15 days after the Express Lane System Approval Test has been completed SI shall submit a report of the results. The report shall include but shall not be limited to the following:

- An executive summary of the overall test results highlighting the general conclusions of the testing and any problems found and corrected;
- The testing compliance matrix modified to include indications of any changes to the testing conducted from the initial submission and an assessment of the system's conformance to the requirements;
- Results of any JPA requested ad hoc testing that was undertaken and brought to System Integrator's attention by JPA; and
- An appendix containing the detailed results of the performance of the test scripts.

7.11.7 Operational Test

The operational test shall be a 90-day evaluation period after the entire Express Lane System has been installed and integration tested during which the system will be observed as to its functional and performance characteristics.

The Express Lane System shall operate reliably and perform in accordance with the specifications and Contract Document requirements during the test. The Express Lane System shall operate without equipment failure and in accordance with the functional and performance requirements for the last 90 days of the evaluation period or the operational test shall be extended until 90 days operation without major equipment failure and in accordance with the functional and performance requirements is achieved. For this purpose major equipment failure is one that results in the loss of functionality related to system requirements in the RFP and the contract documents. Successful completion of the operational test is required for the granting of System Acceptance.

7.11.8 Operational Test Procedures

The Systems Integrator shall prepare Operational Test Procedures defining the procedures and tests to be performed for the installed and operating Tolling Zones.

7.11.9 Operational Test Report

Within 15 days after the Operational Test has been successfully completed, the Integrator shall submit a report of the results. The report shall include but shall not be limited to the following:

- An summary of the overall test results highlighting the general conclusions of the testing and any problems found and corrected; and
- An appendix containing the test results and data used in evaluating the system's operational performance.

7.11.10 Performance Audit

On an annual basis, the Systems Integrator shall conduct a Performance Audit for each operational Tolling Zone to verify that system reliability and accuracy has not degraded over time and the Express Lane System continues to satisfy the functional and performance requirements that are presented in the system design documentation and all other Contract documents.

System transaction data and reports plus MOMS data for at least the 30 days preceding the Performance Audit shall be utilized in the analysis. In addition, controlled tests shall be conducted by utilizing test vehicles mixed with real life traffic. JPA may choose to perform ad hoc operational testing as part of the Performance Audit. The initial Performance Audit shall be conducted and successfully completed as a condition of Final Acceptance. A Performance Audit will be deemed successful by JPA if it is determined that the audit shows that the system requirements presented herein are met.

7.11.11 Performance Audit Procedures

The Systems Integrator shall prepare Performance Audit Procedures defining the procedures and tests to be performed for the installed and operating Express Lane System. The procedures shall identify the test vehicles that are to be mixed with real traffic and the results to be obtained from the tests. The Performance Audit Procedures shall also define the operational data to be reviewed and the analysis that will be conducted on that data.

7.11.12 Performance Audit Report

Within 15 days after the Performance Audit has been completed, the Integrator shall submit a report of the results. The report shall include but shall not be limited to the following:

- A summary of the overall test results highlighting the general conclusions of the testing and any problems found and corrected; and
- An appendix containing the test results and data used in evaluating the system's operational performance.

7.12 MAINTENANCE AND WARRANTY PERIOD REQUIREMENTS

7.12.1 General

The SI shall establish and maintain an effective maintenance program for the new southbound I-680 Express Lane.

The SI shall be solely responsible for full maintenance of the System from the time of installation through the Maintenance/Warranty Period and for the term of any successive maintenance options exercised by the JPA. Maintenance shall be provided through field service, operational testing, remote diagnostics and control, and by maintenance personnel either on-duty or on-call 24 hours a day, seven days a week.

The maintenance warranty periods shall be full warranty periods during which all parts and labor shall be provided by the SI. The standards for response time and repair time established herein shall be met by the SI until completion of the maintenance/warranty period. Where specific guidance is not provided for response and/or repair times, the total downtime of any component or subsystem shall not exceed six hours.

7.12.2 Maintenance Analysis Requirements

The SI shall use analytical methods, appropriate models, and a documented study that shall lead to the definition of resources to be used for maintenance of the new Express Lane System. This means that the number and types of maintenance service personnel assigned to maintenance of the system shall be derived from a careful analysis of system and JPA needs. The spare parts required shall also be derived from a careful and documented analysis. In both cases, personnel and spare parts, the SI shall start its analysis from the contractually required response and repair times as set forth herein and provided in the Proposal.

Personnel and spare parts analysis shall carefully consider geographic distribution of the maintenance sites, vehicles available to transport personnel and spares, traffic and driving times, and back-up services available.

The maintenance analysis shall be documented within the appropriate sections of the maintenance plan. Approval of the maintenance plan shall depend in part on the quality and acceptability of the maintenance analysis incorporated into the plan.

7.12.3 Maintenance Personnel Experience Requirements

The Maintenance Plan required by these specifications address the requirements for describing the maintenance organization and personnel to be used for maintaining the new I-680 Express Lane System. This section provides additional requirements for personnel qualifications to be satisfied by the SI while maintaining the electronic toll collection system.

The numbers and types of maintenance personnel to be used by the SI for maintaining the total system as well as the distribution of personnel shall be the product of maintenance analysis and documented within the maintenance plan.

The maintenance service supervisor shall have a minimum of 10 years of experience in servicing electronic systems and at least five years of experience as a supervisor of technicians or engineers. The maintenance service supervisor shall be available to meet with the JPA ED immediately after the submission of the maintenance plan by the SI. The maintenance service supervisor's resume shall be made available to the JPA ED for review at the earliest opportunity, but in no case later than the date of submission of the maintenance plan.

The maintenance service technicians (of any discipline) shall have an appropriate technical education background and at least three years of experience servicing electronic and/or toll system equipment. In addition, they shall have at least three months of experience in data collection systems.

Any maintenance subcontracts used by the SI shall be fully described within the maintenance plan submitted for the JPA approval, and the Subcontract agreements themselves shall be made available for review by the JPA upon request.

ETS software maintenance personnel shall have not less than an education and experience comparable to that required of the maintenance service technicians. The SI shall describe in the maintenance plan how ETC software maintenance support shall be provided.

All SI personnel shall be subject to appropriate security checks conducted to the satisfaction of the JPA. The SI shall obtain written approval from the JPA for all maintenance service personnel.

7.12.4 Preventive Maintenance

The SI shall develop a preventive maintenance schedule designed to cover all electronic toll collection system components and to ensure optimum maintenance of the system to meet the contractually required reliability and maintainability values. The preventive maintenance schedule shall be submitted as part of the maintenance plan.

7.12.5 Maintenance Transportation

The SI shall provide all necessary vehicles to maintain the new electronic toll collection system at the various sites unless modified by the Special Provisions of these Specifications. All vehicles shall be registered in the State of California. Vehicles shall not carry any special identification unless authorized to do so by the JPA.

All SI maintenance personnel on duty shall be equipped for rapid two-way communication with the maintenance supervisor's office (e.g., a beeper system). The SI shall maintain a maintenance supervisor's office near an electronic toll collection site approved by the JPA.

Each SI vehicle shall be equipped, at the SI's expense, with the test equipment and spare parts derived from the maintenance analysis required by these Specifications and approved by the JPA. The test equipment and spare parts to be carried in each vehicle shall be documented in the maintenance plan.

The SI's vehicles utilized in the performance of this Contract shall not be given non-revenue status to be used on the facility.

7.12.6 ETS System Maintenance Documentation

The SI shall deliver and maintain at a current level seven (7) sets of system documentation including but not limited to as-built drawings, toll equipment service manuals, computer manufacturer manuals, software documentation, flow diagrams, parts lists, and spare parts and components lists.

The distribution of documentation shall be as follows:

SI Project Management Office:	One set
JPA Management Office:	One set
Systems Manager Office:	One set

The SI shall manage system maintenance in such a manner that all maintenance personnel shall be furnished with both the tools and the documentation needed to do the job correctly and efficiently.

7.12.7 Maintainability Program Requirements

The SI shall establish and maintain a maintenance program dedicated to the JPA I-680 Express Lane ETS. At a minimum, the program shall include the following elements:

- a. Written Definition of the Maintenance Concept.
- b. Use of Maintainability Analysis for Optimum Design.
- c. Use of a Model and Analysis for Spare Parts Loading.
- d. Written Predictions of Mean-Time-to-Repair (MTTR) for All Components.
- e. Maintenance Management System Program.
- f. Use of the Maintenance Management System for Actual MTTR Measurements.
- g. Satisfaction of the On-Line Maintainability Demonstration Test.
- h. Maintainability Organization and Staffing Plan.
- i. Design Reviews to Assure Progress.

The SI shall describe its maintainability program in the technical proposal. At a minimum, the proposal response shall describe those elements of the maintainability program listed above.

The proposal response shall be not more than five single-spaced originally composed pages. The submission of a previously existing company maintainability program plan is not encouraged as a response to this proposal requirement except as an attachment for ready reference.

7.12.8 Maintainability Goals and Objectives of the JPA

The SI shall provide with the technical proposal predictions for component and lane maintainability values (MTTR) derived from maintenance records or tests of the SI's product line. The SI shall be required to propose those maintainability values (MTTR) that it is committing to deliver via its electronic toll collection components. The SI shall propose only those maintainability values (MTTR) that it can readily defend by engineering data and that it is prepared to be held accountable for during the on-line maintainability demonstration test and duration of this contract.

The MTTR shall be the total corrective maintenance time divided by the total number of corrective maintenance actions during a given period of time. Corrective maintenance actions shall be those associated with relevant and chargeable failures only.

A failure shall be deemed to exist if the predicted and expected function does not occur. Two-port boundary analysis shall be used and software/firmware shall be included within the two-port boundary.

Relevant and chargeable failures are further discussed in Section 6.11

Response and repair time criteria cited herein shall apply 24 hours a day, seven days a week, for all components of the new electronic toll collection system. The required maintenance analysis and maintenance plan shall be used by the SI to show how the criteria shall be met by the SI during the maintenance warranty periods.

Response time is defined as the interval of time that transpires between the SI's notification of an electronic toll collection system failure and the arrival of the SI's qualified technical person at the failure site to perform the required troubleshoot/repair.

Unless relief is given by an authorized JPA manager/supervisor at the time of the maintenance call, the response time to all tolling zones covered by this Contract shall not exceed two hours. Emergency situations shall be handled on exception basis.

Repair time is defined as the interval of time that transpires between arrival at the failure site by the SI's qualified technical person and complete restoration of the failed component or subsystem to full operational service.

On the average, repair times shall not exceed specified MTTR values and these values shall be used as the accept/reject criteria during the maintainability on-line demonstration.

7.12.9 Maintenance On-Line Management System

The SI shall provide a Maintenance On-Line Management System (MOMS). The MOMS shall allow for monitoring and reporting of equipment failures within the entire set of Tolling Zones that may be procured under this contract

The MOMS shall be the focal point for all Express Lane System maintenance activities including routine preventive and corrective maintenance, real-time monitoring, repair calls, report generation, etc.

Access to MOMS information shall require entry of the user's identification and password from which the system shall retrieve the user's assigned role(s). Personnel access levels to MOMS shall be determined by JPA staff.

At a minimum, the MOMS shall be capable of providing the following information:

- Current Tolling Zone operational status;
- Failure and/or malfunction location;
- Failure and/or malfunction description (w/ priority level);
- Spare parts inventory quantity and control;
- Part and equipment description (including part number and serial number);
- Record of last maintenance activity for a part entered by maintenance staff;
- Record of last preventive and corrective maintenance activity for all parts as entered by maintenance staff; and
- Historical system information/report generation.

7.12.9.1 Failure Detection and Reporting

One primary purpose of the MOMS is to automate the issuance of repair/service calls to maintenance technicians.

The MOMS shall be designed with the ability to generate work orders with little or no human intervention. Work order formats and specifications shall be determined during the design process and approved in writing by JPA, or their designated representative.

The MOMS shall provide for generating a minimum of four (4) different types of work orders, including ad hoc, preventive, corrective and emergency maintenance.

The work order shall record the source of the work order, either as automatically triggered by MOMS monitoring, or the person reporting the failure, or both.

The MOMS shall also provide the capability to build ad hoc work orders for unusual maintenance activities. In addition, a work order shall include, but not be limited to, the following information:

- Date/Time of work order generation;
- Date/Time/Location of repair or maintenance call;
- Work order number (sequential); and

- Failure or malfunction description.

The MOMS shall also provide the capability to generate blank work orders for repairs or malfunctions not directly reported by the MOMS. Blank work orders shall still be generated for the sequential list maintained in MOMS.

The MOMS shall allow both automatic and manually activated paging of technicians once a work order has been generated.

The MOMS shall be designed to accommodate the assignment of priority levels for each failure type.

MOMS shall assign an initial priority level to each failure but shall provide for manual override to account for aspects that impact severity level and MOMS cannot assess.

The paging process shall check to determine the assigned active technician and update the dispatch grid to include the new service call.

MOMS shall monitor the disposition of service calls and shall generate a page to the maintenance technician and/or the maintenance manager for any work order not responded to or repaired within the required time.

7.12.9.2 System Monitoring

The MOMS shall report the status and performance of all levels of Express Lane System equipment in real-time.

The performance monitoring function shall allow the user to select and observe the status and/or performance of several pre-defined portions of the Express Lane system. The following is a breakdown of the various levels, and, at a minimum, the degree of information required to be displayed for each level:

- Tolling Zone level components; and
- All equipment statuses for:
 1. Status of all Tolling Zone applications;
 2. Tolling Zone identification (ID);
 3. Tolling Zone location (Tolling Zone ID);
 4. Tolling Zone overall operation status (operational/degraded);
 5. Current operational status of each major subsystem; and
 6. Status of Tolling Zone communications link.

7.12.9.3 Availability Tracking

The MOMS shall track and calculate the availability of each tolling zone by function.

The calculations shall be performed automatically whenever an availability report is run.

The availability report shall take into account the number of installed Tolling Zones and the length of outages affecting the particular Tolling Zone function.

7.12.9.4 Remote Access

The MOMS shall be designed with the capability to allow technicians and other users to access the MOMS network over the internet.

Technicians or maintenance staff shall typically utilize this function while off-site or to log-in and close out a work order.

The dial-up access shall be designed to utilize simple dial-up connection tools typically found on laptop computers.

Access shall be password protected to prevent unauthorized users from gaining access to the MOMS. A single network password shall not be acceptable for dial-up users. Each user shall use a personal password when logging into MOMS.

7.12.9.5 Inventory/Spare Parts Control

The SI shall provide an integrated spare unit and spare parts inventory control as part of MOMS.

This function shall be integrated with the work order generation function which shall automatically update and maintain the system and spare parts inventory based on work orders and technicians recording of parts used during work order closeout.

7.12.10 Modular Design and Swap-Out Maintenance Requirements

7.13 TRAINING REQUIREMENTS

TBD

8. COST PROPOSAL FORM

DRAFT

9. CONTRACT AFFIDAVITS

DRAFT

10. APPENDICIES

10.1 I-680 EXPRESS CARPOOL LANE SYSTEM CONCEPT OF OPERATIONS DOCUMENT

10.2 I-680 EXPRESS CARPOOL LANE SYSTEM COMMUNICATIONS PLAN

10.3 I-680 SYSTEMS ENGINEERING MANAGEMENT PLAN

10.4 I-680 SYSTEM ENFORCEMENT DOCUMENT

10.5 I-680 SYSTEM REQUIREMENTS DOCUMENT